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FM 100-5

WAR DEPARTMENT FIELD MANUAL

FIELD SERVICE REGULATIONS

OPERATIONS

WAR DEPARTMENT - 15 JUNE 1944

WAR DEPARTMENT FIELD MANUAL
FM 100-5

This manual supersedes FM 100-5, 22 May 1941, including C 1, 16 September 1942; C 2, 14 November 1942; and C 3, 6 [illegible] 1943.

FIELD SERVICE REGULATIONS

OPERATIONS

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WAR DEPARTMENT,

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FM 100-5, Field Service Regulations, Operations, is published for the information and guidance of all concerned. It contains the doctrines of leading troops in combat and tactics of the combined arms and constitutes the basis of instruction of all arms and services for field service. Additional doctrines pertaining to the defense of coast lines and landing operations on hostile shores are discussed in FM 31-10 and 31-5.

Field Service Regulations will be interpreted in the light of FM 27-10. FM 100-5 should be studied in connection with FM 100-10, 100-15, and 100-20.

While the fundamental doctrines of combat operations are neither numerous nor complex, their application is sometimes difficult. Knowledge of these doctrines and experience in their application provide all commanders a firm basis for action in a particular situation. Knowledge and experience enable the commander to utilize the flexible organization with which he is provided to group his forces into task units most suitable for the accomplishment of his mission.

Set rules and methods must be avoided. They limit imagination and initiative which are so important in the successful prosecution of war. They provide the enemy a fixed pattern of operations which he can more easily counter.

It is a function of command to coordinate the tactics and technique of the ground, air, and sea forces, as well as that of the arms and services subordinate to these forces, in order to develop in the forces employed on a given task the teamwork essential to success.

[A. G. 300.5 (5 May 44).]

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For explanation of symbols, see FM 21-6.

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CHAPTER 1

ORGANIZATION

TERRITORIAL ORGANIZATION

1. The *theater of war* comprises those areas of land, sea and air which are, or may become, directly involved in the conduct of war.

2. *Theater of operations* is a term used to designate that portion of the land, sea, and air areas of the theater of war necessary for military operations, either offensive or defensive, pursuant to an assigned mission, and for the administration incident to such military operations. The theater is organized for tactical control and administrative control to the extent indicated by War Department instructions.

3. The *combat zone* comprises that area of the theater required for the armies. It is divided for tactical control into army, corps, and division areas, each controlled by the commander of the corresponding unit. The rear boundary of the combat zone is designated by the theater commander and is changed to conform to the movement of the armies.

4. The *communications zone* is that part of the theater of operations, contiguous to the combat zone, which contains the lines of communication, establishments for supply and evacuation, and other agencies required for the immediate support and maintenance of the field forces in the theater of operations.

For military terms not defined in this manual see TM 20-205.

5. The *zone of the interior* comprises the area of the national territory exclusive of areas included in the theater of operations.

6. The details of organization of the theater of war and its territorial subdivisions are given in FM 100–10, 100–15, and in instructions relative to mobilization published by the War Department. As indicated therein, definite territorial responsibilities are assigned to commanders of theaters, oversea departments, defense commands, base commands, and task forces.

ORGANIZATION OF TROOPS

7. Troop organization includes command, combat (tactical), and service (administrative) elements. Most tactical units contain service elements and have some administrative functions. But a unit is not designated as administrative unless it performs all or nearly all administrative functions for its components.

8. The *Army of the United States* is organized to provide a War Department General Staff under the Secretary of War and the Chief of Staff; an air force, under a Commanding General, Army Air Forces; a ground force, under a Commanding General, Army Ground Forces; and a service force, under a Commanding General, Army Service Forces; and such oversea departments, task forces, base commands, defense commands, commands in theaters of operations, and other commands as may be necessary to the national security.

The *mission of the Army Air Forces* is to procure and maintain equipment peculiar to the Army Air Forces, and to provide air force units properly organized, trained, and equipped for combat operations.

The *mission of the Army Ground Forces* is to provide ground force units properly organized, trained, and equipped for combat operations.

The *mission of the Army Service Forces* is to provide services and supplies to meet military requirements except those peculiar to the Army Air Forces. To provide service units properly organized, trained, and equipped for field operations.

9. The *field forces* consist of the Chief of Staff, the War Department General Staff, and components of air, ground, service, and sea forces organized separately or in combination into armies, task forces, defense commands, base commands, commands in theaters of operation, other commands as may be required for the national security, and a War Department reserve. For a description and discussion of theaters of operations, task forces, and armies see FM 100–15.

10. An *air force* (ch. 3) is composed of a headquarters and a sufficient number of subordinate air elements of suitable type necessary for the accomplishment of the air mission in a theater. For security and administration, troops of the various arms and services are included in an air force. (See sec. III, ch. 1, FM 100–20.)

11. The term *large units* as used in this manual refers to divisions and larger units. A more detailed discussion of the larger units is found in FM 100–15.

12. Several armies may be organized into a *group of armies* under a designated commander. Such a group is primarily a tactical command.

13. An *army* is composed of a headquarters, certain organic army troops, a variable number of corps, and a variable number of divisions. Some or all of the divisions may be assigned from time to time to corps. The army is an administrative as well as a tactical unit.

14. A *corps* consists of a corps headquarters, certain organic corps troops, and such infantry (cavalry, armored) divisions as may be assigned to it. The corps is primarily a tactical unit.

15. The *division* is the basic large unit of the combined arms. It comprises a headquarters, infantry (cavalry, armored) units, field artillery units, and certain troops of other arms and services. It is an administrative as well as a tactical unit.

16. In each arm or service, the *company* (troop, battery) or similar unit is the basic administrative unit. It contains all the agencies required for subsistence, interior economy, and administration. For purposes of tactical control and training, each company is subdivided into smaller units.

17. The *battalion* (squadron) or similar unit is the basic tactical unit. It is composed of a headquarters, two or more companies or similar units, and certain special units, organic and attached. Unless organized as a separate battalion it has few administration functions.

18. The *regiment* is both an administrative and a tactical unit. Ordinarily, the regiment consists of a headquarters, a headquarters company and service company, either separate or combined, and two or more battalions or similar units. It may also include one or more companies or similar units in which certain special weapons and means are assembled for tactical purposes, economy, instruction, and administration.

19. The *group* is a tactical unit and consists only of a headquarters and two or more battalions.

20. A *brigade* is ordinarily a tactical organization composed of two or more regiments or groups of the same arm, together with a headquarters and headquarters company or similar unit. When organized as a separate brigade it may include units of other arms and services and may have administrative functions.

21. For economy and flexibility in the assignment to tasks, the means not habitually required by a unit are pooled and organically assigned to a higher unit. These means may then be allotted to subordinate units in accordance with their requirements for particular operations.

22. To insure unity of effort or increase readiness for combat, part or all of the subordinate units of a command may be formed into one or more temporary tactical groupings (task forces), each under a designated commander. In each. the unity of tactical organizations is preserved as far as practicable. In an infantry division, the term *combat team* is usually applied to a task force consisting of a regiment of infantry, a battalion of light artillery, and essential units of other arms in suitable proportion.

23. The details of organization of the field forces and the amounts and kinds of transportation and major items of equipment are published in current War Department Tables of Organization and Equipment. The organization of large units and pertinent technical and logistical data are given in FM 101–10.

CHAPTER 2

ARMS AND SERVICES

GENERAL

24. The units comprising the field forces belong to the arms and services of the ground, air, and service forces.

The *arms* consist of the Infantry, Cavalry, Field Artillery, Coast Artillery Corps, Corps of Engineers, and Signal Corps. The Chemical Warfare Service also has combat units of chemical troops.

The *services* consist of the Adjutant General's Department, Judge Advocate General's Department, Quartermaster Corps, Ordnance Department, Corps of Engineers, Chemical Warfare Service, Signal Corps, Medical Department, Corps of Chaplains, Corps of Military Police, Finance Department, and Transportation Corps which are charged with serving the Army by performing the necessary functions of administration and supply. For administration and supply functions of the arms and services, see FM 100–10.

25. No one arm wins battles. The combined action of all arms and services is essential to success. The characteristics of each arm and service adapt it to the performance of its special function. The higher commander coordinates and directs the action of all, exploiting their powers to attain the ends sought.

INFANTRY

26. The Infantry is essentially an arm of close combat. Its primary mission in the attack is to close with the enemy and destroy or capture him; in defense, to hold its position and repel the hostile attack.

27. Infantry fights by combining fire, movement, and shock action. By fire, it inflicts losses on the enemy and neutralizes his combat power; by movement, it closes with the enemy and makes its fire more effective; by shock action, it completes the destruction of the enemy in close combat.

28. Infantry is capable of limited independent action through the employment of its own weapons. Its offensive power decreases appreciably when its freedom of maneuver is limited or when it is confronted by an organized defensive position. Under these conditions or against a force of the combined arms, the limited firepower of infantry must be reinforced adequately by the support of artillery, tanks, and other arms. Coordination with combat aviation is also essential. The defensive power of infantry reaches a maximum when it occupies an organized defensive position or when the enemy's freedom of maneuver is restricted.

29. The principal weapons of infantry are the rifle and bayonet, the automatic rifle, the machine gun, and the mortars. Other weapons include carbines, pistols, grenades, light antitank weapons, antitank guns, and close support howitzers.

The intrenching tool is an essential article of equipment of the infantry soldier. It is important in attack as well as in defense in order to hold ground without excessive casualties during interruptions of the advance.

30. Infantry can maneuver on difficult ground. Its ability to move in small and inconspicuous formations enables it to take advantage of covered routes of approach and minor accidents of the terrain. It must utilize the terrain intelligently to attain maximum fire effect, to conserve personnel, to conceal movement, and to facilitate the maneuver and employment of reserves.

31. The mobility of infantry has been increased greatly by the use of motor transport for the movement of troops, equipment, and supplies. Infantry units completely motorized are suited specially for the close support of mechanized units or for prompt dispatch as mobile reserves to distant areas accessible by road.

Infantry troops, with equipment and supplies, may also be moved by air or water transport to seize decisive objectives or to operate in the enemy's rear area.

CAVALRY

32. Cavalry consists of highly mobile ground units of two types: horse units and mechanized reconnaissance units.

The efficiency of cavalry depends in great measure upon the condition of its mounts and vehicles. Provision must be made for the rest and subsistence of animals and for the maintenance and upkeep of vehicles. Horse units may be transported in trucks or semi-trailers in order to increase their mobility or to conserve animals.

HORSE CAVALRY

33. Cavalry is characterized by a high degree of battlefield mobility. Its special value is derived from the rapidity and ease with which its fire power can be moved from one position or locality to another. (See also ch. 15.)

34. Horse cavalry capabilities are offensive combat; exploitation and pursuit; seizing and holding important terrain until the arrival of the main forces; ground reconnaissance; ground counterreconnaissance (screening), both moving and stationary; security for the front, flanks, and rear of other forces on the march, at the halt, and in battle; delaying action; covering the retrograde movements of other forces; combat

liaison between large units: acting as a mobile reserve for other forces; harassing action; and surprise action against designated objectives deep in hostile rear areas.

35. Horse cavalry obtains its best results by the rapidity and flexibility of its methods in attack and defense rather than by the sustained offensive or defensive operations that are required of infantry. It should be assigned missions which will permit exploitation of its mobility. It is particularly effective on terrain not suited for armored or motorized units. Ordinarily it should not be employed against objectives which require the sustained power of infantry. When no suitable or necessary missions exist for cavalry, it should be held in reserve, awaiting the opportunity for appropriate employment.

36. Horse cavalry can operate over almost any terrain and under all conditions of weather. It fights on a relatively broad front and in slight depth. In offensive combat, relatively weak forces may contain a less mobile enemy on the front while the principal forces strike in flank and rear.

Horse cavalry habitually maneuvers mounted, but ordinarily fights on foot. As a rule. mounted maneuver is combined with dismounted action.

37. Horse cavalry is equipped with weapons similar to those of infantry and has strong fire power; it is provided with means for rapid signal communication. reconnaissance vehicles and armored cars for reconnaissance, and motor transport to supplement its animal transportation for supply.

MECHANIZED CAVALRY

38. *Mechanized cavalry* units are organized, equipped, and trained to perform reconnaissance missions employing infiltration tactics, fire, and maneuver. They engage in combat only to the extent necessary to accomplish the assigned mission.

Reconnaissance units on reconnaissance missions contribute to the security of the main force by reporting the locations of enemy forces and by giving timely warning of ground and air attacks. Information and warnings are transmitted directly to units whose security is threatened and to higher headquarters. When opposing main forces close, mechanized cavalry may be employed on reconnaissance missions toward an exposed flank, used to maintain liaison with adjacent units, or placed in reserve.

39. Mechanized cavalry units perform distant, close, and battle reconnaissance within zones or areas, or along designated routes or axes. Units may be employed dismounted on reconnaissance missions when the use of vehicles is impracticable. The zone assigned will vary with the size of the reconnaissance unit, the routes available to the enemy, the effect of terrain and weather on visibility and movement, the information desired by the higher commander, and the facility with which reserves can be moved within the zone.

The frontage for a platoon reconnoitering a zone should not exceed four miles. A troop with one platoon in reserve initially can reconnoiter a zone ten miles in width, while a squadron with one reconnaissance troop and the light tank company in reserve initially can reconnoiter a zone twenty-five miles wide.

The rate of advance of units engaged in reconnaissance can be ten miles per hour on open terrain under favorable conditions, but unfavorable conditions may reduce the rate even to that of dismounted reconnaissance.

The time interval by which reconnaissance units precede the main force in an advance must be determined in each instance after a consideration of all factors which may affect the rate of advance of the reconnaissance units.

40. *Night reconnaissance* is less effective than daylight reconnaissance and is limited ordinarily to dismounted patrolling, observation of routes, and the use of listening posts.

41. Operations of mechanized cavalry and aviation are complementary. Aviation provides information which facilitates the execution of ground reconnaissance missions and conserves ground reconnaissance elements.

FIELD ARTILLERY

42. Field Artillery contributes to the action of the entire force through the fire support which it renders other arms. It has two principal missions in combat:

a. It supports infantry (cavalry, armored) units by fire, neutralizing or destroying those targets which are most dangerous to the supported arms.

b. It gives depth to combat by counterbattery fire, by fire on hostile reserves, by restricting movement in rear areas, and by disrupting hostile command agencies.

43. Artillery fire possesses great power of destruction and neutralization. It compels hostile troops in the open to adopt widely deployed formations and has adverse morale effect. Fire from curved-trajectory weapons reaches objectives defiladed against flat-trajectory weapons or lacking adequate overhead cover.

44. Artillery fire possesses a high degree of flexibility. Field artillery is capable of intervening over a zone of great width and depth, and of rapidly shifting and concentrating its fire without changing its positions. This characteristic makes it possible to concentrate the fire of large masses of field artillery under a common fire direction. Through the maneuver of artillery fire, commanders possess a powerful means of influencing the course of combat. The efficiency with which artillery fires are maneuvered is dependent upon adequate control, close liaison with supported troops, sufficient observation, and dependable signal communication.

45. In order to carry out its principal combat missions, division field artillery ordinarily is subdivided for combat so that certain units are assigned to the direct support of specified infantry (cavalry, armored) units and the remainder is retained in general support of the division as a whole.

46. The assignment of direct support missions to field artillery units insures close cooperation with the supported units and enables such artillery to act with greater promptness in meeting the requirements of a rapidly moving situation on the front of the supported units. A field artillery unit in direct support establishes liaison and signal communication with the supported unit and as far as possible executes the missions requested by the supported unit. Direct support artillery changes position when necessary to deliver the supporting fires requested and to maintain close liaison with the supported unit.

47. Whenever the situation permits, both direct support and general support artillery are retained under centralized control. Field artillery operates most effectively in this manner. However, the division artillery commander frequently cannot control efficiently the fire of all of his artillery because of the character of the operations, unusual extension of frontage, difficulties of terrain, lack of suitable observation, or insufficiency of signal communication. In such situations he should attach artillery promptly to the infantry (cavalry, armored) units which it is to assist.

48. *Corps (army) field artillery* may be retained under corps (army) control, or part or all of it may be attached to divisions (corps). Units held under corps (army) control may be directed to furnish special assistance to designated divisions (corps).

49. *Division artillery* is most effective in fire on unprotected personnel. Its principal mission is the support of infantry (cavalry, armored) units by fire on those targets which are most dangerous to the supported units. It is employed also to neutralize enemy observation, to interdict hostile movements, and to assist corps artillery in counterbattery. It must be prepared to engage promptly hostile tanks within its field of fire.

50. *Corps artillery* includes a headquarters, observation battalion (sound and flash), and such units as may be attached from time to time by higher headquarters and retained under the direct control of the corps commander.

It has for its principal mission the neutralization or destruction of hostile artillery. It is employed also in the destruction of hostile defenses, in long range interdiction fire, and in reinforcing the fires of division artillery (see par. 89).

51. *Army artillery* includes such units as are allotted from time to time by higher headquarters and retained under the direct control of the army commander for support of the army as a whole. It has for its principal missions distant interdiction and destruction fire, and reinforcement of the fire of corps artillery.

52. When occasion requires, particularly when there is a great massing of field artillery, temporary groupings of field artillery units may be formed for convenience in the execution of missions. These groupings are based upon the nature of the mission to be executed rather than upon type or caliber. Tactical unity is, so far as practicable, respected in the composition of groupings.

53. The Coast Artillery Corps comprises two sections: *seacoast artillery and antiaircraft artillery.* Its armament consists of fixed and mobile seacoast artillery, controlled submarine mines, and fixed, semimobile, and mobile antiaircraft artillery.

54. The missions of seacoast artillery are to—

a. Protect, in conjunction with the Army Air Forces and the Navy, elements of the fleet while at, entering, or debouching from their bases and to defeat naval and air attacks against harbor defenses, cities, or other important installations.

b. Support the combined arms in beach defense.

c. Support the combined arms in field operations while acting as army or theater reserve artillery

55. *Fixed seacoast artillery* is equipped with large caliber, long range guns, searchlights, and radars, and is trained specially to fire at moving naval targets. Its stability permits great accuracy of fire. Its elaborate and precise fixed equipment permits highly effective fire control and fire direction. For tactical control, seacoast artillery is organized into battalions and groups.

56. *Mobile seacoast artillery* comprises railway and motor-drawn artillery. It provides additional gun fire for existing harbor defenses and is used with the other arms to protect harbors or coastal areas for which no permanent defenses have been provided.

Mobile seacoast artillery is used with the field forces as heavy, supporting artillery. Off the battlefield, it is capable of moving long distances at fairly rapid rates. On the battlefield its mobility is low and considerable time is required for emplacement.

57. *Controlled submarine mines* are used to supplement the offensive action of other weapons in repelling hostile naval attack and to limit or prevent freedom of maneuver by hostile naval forces both surface and submarine.

58. *Antiaircraft artillery* is equipped with antiaircraft guns, automatic weapons, searchlights, radars, barrage balloons, and the equipment required for observation. fire control, and signal communication. The primary mission of antiaircraft artillery is to provide local protection for field forces and important ground establishments against all forms of enemy air attacks and activities by day and by night.

Antiaircraft artillery may also be used against ground targets. Due to the characteristics of its weapons—high muzzle velocity and flat trajectory—these weapons may be used effectively for direct fire against tanks, fortifications, and small naval or land craft. When used on these missions little air defense should be expected and consequently it should not be employed against these targets unless the air threat is secondary.

An essential agency of antiaircraft artillery is its intelligence service (AAAIS). This service gathers and transmits information of the enemy's air activities for use in connection with the employment of the antiaircraft artillery units. Antiaircraft artillery is also provided with information regarding hostile aircraft by the aircraft warning service. Rapid interchange of information between these services is essential.

Coordinated antiaircraft defense of areas is essential and is facilitated by the establishment of air defense commands.

CORPS OF ENGINEERS

59. The Corps of Engineers has the primary mission of increasing the combat power of the field forces by construction or destruction. especially that which facilitates the movement of troops or impedes that of the enemy.

60. Engineers facilitate the movement of troops by the removal and passage of enemy obstacles, mine fields, and road blocks; the construction and repair of routes of communication (except signal communication), including ferrying and bridging operations and the preparation of airfields; and the supply of engineer tools and equipment.

61. The mission of hindering enemy movement is often of great importance. The inherent mobility of enemy motorized and mechanized forces must be countered by coordinated and intensive use of obstacles and demolitions. Obstacles may consist of hastily erected barriers, such as road blocks and mine fields, as well as deliberately prepared zones of obstacles.

62. Engineers make, reproduce, and supply maps and map substitutes, including those produced from air photographs.

63. Special engineer missions include water supply, the operation of all utilities not assigned to other arms and services, and the supply, repair, and maintenance of engineer materials and equipment, including camouflage materials.

SIGNAL CORPS

64. Signal troops have the primary combat mission of providing signal communication for the command to which they are assigned.

Means of signal communication include messenger, wire (telephone, telegraph, and teletypewriter), radio, facsimile, pigeon, visual, and sound.

65. Signal troops assigned to divisions, corps, armies, and theaters comprise construction units for the installation of wire circuits; and operating units for the installation of wire centrals and radio stations, and the operation of message centers, messenger, wire, radio, and visual communications. In addition, signal troops assigned to field armies and theaters include units which provide signal intelligence, photographic, pigeon, signal repair, and supply services.

66. a. The Signal Corps provides signal centers, local messengers, and wire and radio communications for all headquarters of the air forces to which have been assigned signal troops. In general, this will include all air headquarters except those of groups and squadrons.

b. The Signal Corps provides radio used solely for administrative purposes at headquarters, Army Air Forces, air force headquarters of defense commands, and air base headquarters. The Signal Corps also installs and operates a signal supply and repair establishment at each air base (TM 11–452).

c. The Signal Corps provides radio equipment for the following air navigational aids:

(1) Radio compass and marker beacon receivers.

(2) Airborne radar.

(3) Ground control interception (GCI) for homing aircraft.

(4) Army airways communications system (AACS).

(*a*) Radio range.

(*b*) Marker beacon.

d. Signal troops establish and operate the aircraft warning service (FM 11–25) including—

(1) Ground observer system.

(2) Radar installations.

(3) Communications for ground control interception (GCI).

(4) Aircraft identification.

e. The *signal intelligence service* is charged with the interception of enemy wire and radio transmission and the location, by radio position finding, of enemy radio transmitters operating on the ground and in airplanes. It is charged with the location of radio transmitters operating in violation of proclamations or orders, and with the interception of radio transmissions of friendly stations to detect violations of regulations governing the use of codes and ciphers and of radio procedure. The signal intelligence prepares and solves codes and ciphers. (For further details, see FM 11–35.)

67. The Signal Corps exercises technical supervision over the entire signal service of the field forces. It supplies other arms and services with the technical equipment required for the installation of their own systems of signal communication.

CHEMICAL WARFARE SERVICE

68. Combat troops of the Chemical Warfare Service engage directly in combat to assist other units of the field forces by the use of gas, smoke, incendiaries, and high explosives.

Chemical units are theater of operations forces. They are attached to armies and lower units as the situation requires. Chemical units may be employed profitably in mass for large scale gas operations or in small units for minor operations under divisions or lower unit control. Normally a chemical battalion is attached to a division and may in turn be broken down into a weapons company or platoon under infantry regiment or battalion control, firing HE concentrations to supplement artillery fire or to relieve artillery for other missions, and firing gas or smoke missions. These units are employed well forward.

Operations of chemical units in combat are coordinated by the higher commander as may be necessary to avoid interference by gas or smoke with the operations of other friendly troops.

59. For details of the tactical employment of chemical combat troops, see FM 3–5, and for classification and functions of Chemical Warfare Service units, see FM 100–10.

CHAPTER 3

THE AIR FORCES

GENERAL

70. The *air force* is the largest tactical unit of the Army Air Forces. It may contain a strategic air force, a tactical air force, an air defense command, and an air service command. The organization of an air force is not rigid but conforms to the task to be performed. The combined action of these forces is necessary for the successful accomplishment of the air mission and for missions coordinated with ground and sea forces. The air commander is responsible for the conjunction and cooperation of the subordinate air forces. The coordination of air, ground and sea forces is a function of command and is the responsibility of the theater or task force commander exercising command over these three forces.

71. The Army Air Forces operate against hostile air power, sea power, and land power independently or in conjunction with ground and naval forces.

72. Air operations may be restricted by hostile air force operations, by antiaircraft measures, by the lack of air bases, and by adverse weather conditions.

73. The inherent flexibility of air power is its greatest asset. Its mobility, speed, and range make it possible to apply air power in mass against selected areas in turn. To exploit this capability fully the control of available air power is centralized and command is exercised through the air force commander. Successful centralized control also involves flexible advance plans sufficiently detailed to meet any development.

74. Definition of air force terms:

a. *Combat aviation* refers to bombardment and fighter aviation.

b. *Bombardment aviation* applies to aircraft and units whose primary function is the attack of surface objectives.

c. *Fighter aviation* applies to all aircraft and units whose primary function is air fighting. *Fighter-bomber* aircraft are fighters modified to attack surface objectives.

d. *Reconnaissance aviation* applies to units whose primary function is to secure information for military commands, both ground and air, through visual and photographic means.

e. *Photographic aviation* applies to air units which perform photographic reconnaissance beyond the responsibilities or capabilities of reconnaissance aviation and perform special photogrammetric mapping missions for engineer topographic troops. Its services are usually reserved for the use of theater or other similar headquarters.

f. *Troop carrier aviation* (including gliders) applies to air units which carry airborne troops, ground troops, and cargo.

g. *Liaison aviation* is the term applied to aircraft and air units whose primary functions include courier or messenger service and observation of artillery fire. Liaison aircraft are light and unarmed. They can use small and hastily prepared landing fields. They are vulnerable to small arms fire and are seldom used over or near defended hostile areas. They may be an integral part of ground units.

h. *Air transport aviation* is employed to transport by air, personnel, material, and mail for all War Department agencies.

i. *Service center* is a mobile organization provided to establish and operate the necessary third echelon maintenance, reclamation and supply points within close supporting distance of combat air units. Service centers normally are set up on the basis of one for each two combat groups.

THE STRATEGIC AIR FORCE

75. The *strategic air force* is the long range arm of the air forces. It consists of units equipped with long range bombardment aviation and long range fighter escort units necessary to accomplish its mission of attacking strategic objectives. It also has photographic aviation units for necessary mapping and photographic reconnaissance.

76. The strategic air force employs heavy bombers for the accomplishment of its mission. Long range fighter escort is used to increase the defensive fire power of the bomber formation and to further the effectiveness of the bombers by insuring penetration of the strategic targets. The fighters also are employed to protect the bomber bases which are vulnerable to enemy air attack.

77. The attrition of enemy aircraft is incidental to the mission of the strategic air force but is nevertheless a furtherance of the first *mission* of the air forces in general, that is, to destroy the enemy air force.

78. The strategic air force may be assigned tactical air force missions with the tactical air force when the action is vital and decisive, but this deviation from basic employment is rare.

79. Whenever a hostile nation is subject to regular bombardment by our air forces, it will be necessary to concentrate a large part of the effort against that nation's aircraft factories to curtail production of fighter aircraft to the point where strategic bombing of other targets is economical.

80. On some occasions, part of the mission of the strategic air force will be the long range reconnaissance of the sea approaches to the combat zone.

THE TACTICAL AIR FORCE

81. The *tactical air force* consists of light and medium bombardment units, fighter aviation units, reconnaissance aviation units, and an aircraft warning service (see FM 31–35 and 100–20).

82. The mission of the tactical air force is to obtain the necessary degree of air superiority; to prevent the movement of hostile troops and supplies into the theater of operations and especially into the combat zone; and to participate in a combined effort of the air and ground forces, in the battle area, to gain objectives on the immediate front of the ground forces.

83. The tactical air force employs fighter aviation for the destruction of enemy aircraft in the air. It employs light and medium bombardment aviation for destruction of enemy aircraft on the ground and enemy aircraft bases. The aircraft warning service is employed to increase the efficiency of the offensive role of fighter aviation as well as to protect our own installations.

84. Because of the speed and powers of evasion inherent in all aircraft, air fighting is generally of brief duration and the results are often indecisive. As a result, unless greatly superior, aviation is incapable of controlling the air in the same sense that surface forces can control an area and, therefore, can reduce hostile air operations only to a limited extent.

85. The decision to launch a combined operation and to wage subsequent offensives is strongly influenced by the prior attainment of air superiority in the area of operations. The hostile rear area is the most favorable area of action for combat aviation, since operations in this area permit full utilization of striking power against concentrated targets with minimum losses and maximum results. These attacks disrupt the enemy's communications, destroy his supplies, delay reinforcements, and when timed with the effort of the friendly ground forces, assist in turning a retirement into a rout.

86. Air attacks against selected objectives in the battle area in furtherance of the combined air-ground effort require team work, mutual understanding, and close cooperation between ground and air commanders. Such attacks are directed against targets readily identified from the air, and safety is provided for friendly troops by phase lines or bomb safety lines which are set up and rigidly adhered to by both ground and air.

87. Reconnaissance aviation employs several types of aircraft to accomplish its mission of obtaining information about the enemy. It utilizes both air photography and air reconnaissance to achieve this information. The air headquarters and the ground units must exchange liaison officers and provide them with suitable means of communications to insure quick transmission of requests from the ground units and to disseminate speedily the results of air reconnaissance.

88. Aircraft may communicate with the ground by various means including radio, dropped messages, sound, pyrotechnics, lights, smoke, and maneuvers of aircraft. Because of the high speed of modern aircraft, pick-up of messages is feasible only with liaison type aircraft.

89. When high performance aircraft is used in adjusting long range artillery fire the Army Air Forces is responsible for providing the necessary radio communication between the artillery unit conducting the firing and the aircraft adjusting the fire.

THE AIR DEFENSE COMMAND

90. *Air defense* is the direct defense against hostile air operations as distinguished from the indirect defense afforded by counter air force operations. Its means may include fighter aviation, antiaircraft artillery, searchlights, barrage balloons, and aircraft warning service.

91. The mission of the air defense command is to prevent, oppose, and reduce the effectiveness of hostile air action in the zone to which the command is assigned. It accomplishes this mission by both active and passive defense. Active air defense comprises all measures aimed at destroying or threatening destruction of hostile aircraft and their crews in the air. Passive air defense is provided by warning of impending air attack, dispersion, camouflage, blackouts, and other measures which minimize the effect of hostile air attack.

92. Suitable methods of distinguishing between friendly and hostile aviation must be devised early in the operations and disseminated to all air and antiaircraft units in the theater to increase the effectiveness of the air defense and to protect friendly aviation.

93. The air defense command employs fighter aviation. aircraft warning service, antiaircraft artillery, searchlights, and barrage balloons for active defense. All antiaircraft units employed in air defense operations within the air defense area of a fighter command are under the command of the fighter commander. Tactics and technique of air defense are covered in FM 1–25 and 4–100.

THE AIR SERVICE COMMAND

94. The air service command consists of all air force service units such as air quartermaster, ordnance, signal, chemical, medical, engineer depots, and service centers.

95. The mission of the air service command is procurement, supply, repair, reclamation, construction, transportation, salvage, and other services required by the tactical units of an air force. This command provides all repair and maintenance of equipment beyond the responsibility of first and second echelons of maintenance.

96. Units of the air service command should operate as far forward in the combat zone and as near the air bases of tactical units as is consistent with the safety of these organizations. For further details of organization, function, and methods of operation of an air service command, consult Army Air Forces Regulations 65–1.

CHAPTER 4

LEADERSHIP

97. Leadership is based on knowledge of men.

98. Man is the fundamental instrument in war: other instruments may change but he remains relatively constant. Unless his behavior and elemental attributes are understood, gross mistakes will be made in planning operations and in troop leading.

In the training of the individual soldier, the essential considerations are to integrate individuals into a group and to establish for that group a high standard of military conduct and performance of duty without destroying the initiative of the individual.

99. War places a severe test on the physical endurance and moral stamina of the individual soldier. To perform his duties efficiently, he must not only be well equipped and technically trained but he must also be physically qualified to endure the hardships of field service and be constantly fortified by discipline based on high ideals of military conduct. Strong men, inculcated with a proper sense of duty, a conscious pride in their unit, and a feeling of mutual obligation to their comrades in the group, can dominate the demoralizing influences of battle far better than those imbued only with fear of punishment or disgrace.

100. In spite of the advances in technology, the worth of the individual man is still decisive. The open order of combat accentuates his importance. Every individual must be trained to exploit a situation with energy and boldness and must be imbued with the idea that success will depend upon his initiative and action.

101. The dispersion of troops in battle caused by the influence of modern weapons makes control more difficult. Cohesion within a unit is promoted by good leadership, discipline, pride in the accomplishments and reputation of the unit, and mutual confidence and comradeship among its members.

102. Leading troops in combat, regardless of the echelon of command, calls for cool and thoughtful leaders with a strong feeling of the great responsibility imposed upon them. They must be resolute and self-reliant in their decisions, energetic and insistent in execution, and unperturbed by the fluctuations of combat.

103. Troops are influenced strongly by the example and conduct of their leaders. *A leader must have superior knowledge, will power, self-confidence, initiative, and disregard of self. Any show of fear or unwillingness to share danger is fatal to leadership. On the other hand, a bold and determined leader will carry his troops with him no matter how difficult the enterprise.* Mutual confidence between the leader and his men is the surest basis of discipline. To gain this confidence, the leader must find the way to the hearts of his men. This he will do by acquiring an understanding of their thoughts and feelings, and by showing a constant concern for their comfort and welfare.

104. A good commander avoids subjecting his troops to useless hardships; he guards against dissipating their combat strength in inconsequential actions or harassing them through faulty staff management. He keeps in close touch with all subordinate units by means of personal visits and observation. It is essential that he know from personal contact the mental, moral, and physical state of his troops, the conditions with which they are confronted, their accomplishments, their desires, and their needs.

105. The commander should extend prompt recognition for services well done, lend help where help is needed, and give encouragement in adversity. Considerate to those whom he commands, he must be faithful and loyal to those who command him. A commander must live with his troops and share their dangers and privations as well as their joys and sorrows. By personal observation and experience he will then be able to judge their needs and combat value. A commander who unnecessarily taxes the endurance of his troops will only penalize himself. The proper expenditure of combat strength is in proportion to the objective to be attained. When necessary to the execution of the mission, the commander requires and receives from his unit the complete measure of sacrifice.

106. A spirit of unselfish cooperation with their fellows is to be fostered among officers and men. The strong and the capable must encourage and lead the weak and less experienced. On such a foundation, a feeling of true comradeship will become firmly established and the full combat value of the troops will be made available to the higher commander.

107. The combat value of a unit is determined in great measure by the soldierly qualities of its leaders and members and its will to fight. Outward marks of this combat value will be found in the set-up and appearance of the men, in the condition, care, and maintenance of the weapons and equipment, and in the readiness of the unit for action. Superior combat value will offset numerical inferiority. Superior leadership combined with superior combat value of troops constitutes a reliable basis for success in battle.

108. A poorly trained unit is likely to fail in a critical moment due to demoralizing impressions caused by unexpected events in combat. This is particularly true in the first engagements of a unit. Therefore, training and discipline are of great importance. Every leader must take energetic action against indiscipline, panic, pillage, and other disruptive influences. Discipline is the main cohesive force that binds the members of a unit.

109. A wise and capable commander will see that the men assigned to the component groups of his unit are compatible and that the composition of the groups is changed as little as possible. He will provide each group with a leader in whom its members have confidence. He will so regulate the interior administration of the unit that all groups perform the same amount of work and enjoy the same amount of leisure. He will see that demonstrated efficiency is promptly recognized and rewarded. He will set before all a high standard of military conduct and apply to all the same rules of discipline.

110. Good morale and a sense of unity in a command cannot be improvised; they must be thoroughly planned and systematically promoted. They are born of just and fair treatment, a constant concern for the soldier's welfare, thorough training in basic duties, comradeship among men, and pride in self, organization, and country. The establishment and maintenance of good morale are incumbent upon every commander and are marks of good leadership.

111. The first demand in war is decisive action. Commanders inspire confidence in their subordinates by their decisive conduct and their ability to gain material advantage over the enemy. A reputation for failure in a leader destroys morale. The morale of a unit is that of its leader.

A commander must bear in mind that physical unfitness will undermine his efficiency. He owes it to the men under his command to conserve his own fitness.

Neglect renders him unable to bring a normal mind to the solution of his problems, and reacts unfavorably on his whole command.

CHAPTER 5

THE EXERCISE OF COMMAND

DOCTRINES OF COMBAT

112. The ultimate objective of all military operations is the destruction of the enemy's armed forces in battle. The ability to select objectives whose attainment contributes most decisively and quickly to the defeat of the hostile armed forces is an essential attribute of an able commander.

113. Simple and direct plans promptly and thoroughly executed are usually decisive.

114. *Unity of command* obtains that unity of effort which is essential to the decisive application of the full combat power of the available forces. Unity of effort is furthered by full cooperation between elements of the command. Command of a force of combined arms is vested in the senior officer present eligible to exercise command.

115. Through offensive action a commander exercises his initiative, preserves his freedom of action, and imposes his will on the enemy. A defensive attitude may be deliberately adopted, however, as a temporary expedient while awaiting an opportunity for counteroffensive action, or for the purpose of economizing forces on a front where a decision is not sought. The selection by the commander of the right time and place for offensive action is a decisive factor in the success of the operation.

116. Numerical inferiority does not necessary commit a command to a defensive attitude. Superior hostile numbers may be overcome through greater mobility, better armament and equipment, more effective fire, higher morale, and better leadership. Superior leadership often enables a numerically inferior force to be stronger at the point of decisive action.

117. A *strategically defensive mission* is frequently most effectively executed through offensive action. It is often necessary for an inferior force well disposed for combat to strike poorly disposed hostile forces early before changes in the enemy disposition can be made.

118. Concentration of superior forces, both on the ground and in the air, at the decisive place and time and their employment in a decisive direction, creates the conditions essential to victory. Such concentration requires strict economy in the strength of forces assigned to secondary missions. Detachments during combat are justifiable only when the execution of tasks assigned them contributes directly to success in the main battle.

119. *Surprise* must be sought throughout the action by every means and by every echelon of command. It may be obtained by fire as well as by movement. Surprise is produced through measures which either deny information to the enemy or positively deceive him as to our dispositions, movements, and plans. Terrain which appears to impose great difficulties on operations may often be utilized to gain surprise. Surprise is furthered by variation in the means and methods employed in combat and by rapidity of execution.

Surprise often compensates for numerical inferiority of force.

120. To guard against surprise requires a correct estimate of enemy capabilities, adequate security measures, effective reconnaissance, and readiness for action of all units. Every unit takes the necessary measures for its own local ground and air security. Provision for the security of flanks and rear is of special importance.

COMMAND

121. Command is the authority which an individual in the military service lawfully exercises over subordinates by virtue of rank or assignment.

122. Command and leadership are inseparable. Whether the force is large or small, whether the functions of command are complex or simple, the commander must be the controlling head; his must be the master mind.

123. Decision as to a specific course of action is the responsibility of the commander alone. While he may accept advice and suggestions from any of his subordinates, he alone is responsible for what his unit does or fails to do.

124. A willingness to accept responsibility is the foremost trait of leadership. Every individual from the highest commander to the lowest private must always remember that inaction and neglect of opportunities will warrant more severe censure than an error of judgment in the action taken. The subordinate unit is a part of a tactical team employed by the higher commander to accomplish a certain mission, and any independence on the part of a subordinate commander must conform to the general plan for the unit as a whole.

125. The commander's mission is contained in the orders which he has received. Nevertheless, a commander of a subordinate unit cannot plead absence of orders as an excuse for inactivity. If the situation does not permit communication with the superior commander and the subordinate commander is familiar with the general plan of operations or the mission of the whole command, he should take appropriate action and report the situation as early as practicable.

126. In spite of the most careful planning and anticipation, unexpected obstacles, frictions, and mistakes are common occurrences in battles. A commander must school himself to regard these events as commonplace and not permit them to frustrate him in the accomplishment of his mission.

127. Personal conferences between the higher commander and his subordinates who are to execute his orders are usually advisable, that the latter may arrive at a correct understanding of the plans and intentions of their superior.

128. All the troops assigned to the execution of a distinct mission should be placed under one command, to function as a task force for the duration of the operation. So long as a commander can exercise effective control, he does not disturb the established chain of command in his forces. Better support or coordination frequently can be effected by decentralized control such as during marches or in rapidly changing situations.

129. A commander who is advanced to a higher command should be relieved from the responsibility of direct command of his former unit.

ESTIMATE OF THE SITUATION

130. In any operation, the commander must evaluate all the available information bearing on his task, estimate the situation, and reach a decision. Estimation of the situation is a continuing process and changed conditions may call for a new decision at any time.

131. The estimate often requires rapid thinking, with consideration limited to essential factors. In campaign, exact information concerning the enemy can seldom be obtained. To delay action in an emergency because of incomplete information shows a lack of energetic leadership, and may result in lost opportunities. The commander must take calculated risks.

132. The capabilities of the opposing forces and the possible effect of their employment must be continually evaluated. The commander must guard against the belief that he has discovered the enemy's intentions and consequently ignoring other lines of action open to the enemy.

133. In estimating the capabilities of forces, both friendly and hostile, the commander must be provided with full and up-to-date information on the existing and probable future weather conditions.

134. For further details, see FM 101-5.

TERRAIN

135. That part of the commander's estimate dealing with terrain often exercises a decisive influence upon his decision and plan. Proper evaluation and utilization of the terrain reduce the disadvantage of incomplete information of the enemy. The more important features to be considered in evaluating terrain include not only natural ground forms such as mountains, ridges, streams, bodies of water, woods, and open spaces, but also artificial features such as roads, railroads, and towns. The commander seeks always to utilize the terrain to his own advantage and to the enemy's disadvantage.

136. The mission is the basic factor in the commander's estimate. This may be frequently resolved in terms of terrain. Thus it may be vital to hold certain dominating ground, to protect a certain defile, or to capture such features. Where possible, reducing the mission to terms of terrain may aid in the proper evaluation of the terrain.

137. Maps are the basis for terrain studies, but must be checked by air reconnaissance, air photographs, and ground reconnaissance. Changes in the terrain, especially in the road net, occur continually. When discovered, such changes must be reported promptly to higher headquarters.

138. Terrain should always be evaluated in terms of the following five factors: observation, fields of fire, concealment and cover, obstacles, and routes of communication.

139. Features such as ridges, streams, woods, and towns usually divide the terrain more or less into separate areas. Such an area frequently consists of a valley lying between two ridges, or an open space between two woods. When the terrain features inclosing the area prevent direct fire and observation into it from positions outside, the area is called a *compartment*.

140. A compartment of which the longer axis extends in the direction of movement of a force, or leads toward or into a defensive position, is called a *corridor*. A compartment which extends generally across the direction of movement of a force, or its front, is called a *cross-compartment*.

CONDUCT IN BATTLE

141. The commander's decision for his unit as a whole, and the missions to subordinate units are communicated to subordinates by clear and concise orders.

142. After providing for the issuance of orders, the commander places himself where he can best control the course of action and exert his leadership. When opportunity offers and when his presence at the command post is not urgently required, he will visit his subordinate commanders and his troops in order to inspire confidence and to assure himself that his orders are understood and properly executed.

143. Whenever the commander leaves his command post, he should orient his staff as to further plans to be made or measures to be taken in anticipation of future contingencies, and should inform his staff where he can be reached.

144. During the decisive phase of battle, the place of the commander is near the critical point of action.

145. A commander influences the course of subsequent action by his leadership, by the use of his reserves, by the concentration of artillery, and by other supporting units.

146. The duration of a tacitcal operation seldom can be predicted. Successful engagements sometimes progress so slowly that the gains made are not immediately apparent. At other times, they progress so fast that the gains made can be capitalized only by the most aggressive and far-sighted leadership.

147. Losses must be anticipated by the commander and his staff who will take timely measures for replacement of men, units, transports, and weapons, and for replenishment of ammunition and other supplies. When the situation permits, troops which have been heavily engaged are rested, losses in personnel and equipment are replaced, the unit is reorganized and time is allotted for some training to weld replacements into the team before the unit is assigned a new and important mission.

STAFF

148. The staff assists the commander to the extent that he may require, by providing information, data, and advice; by preparing detailed plans and orders in accordance with his directions; and by exercising such supervision over the execution of his orders as he may prescribe. *A staff officer, as such, does not exercise command.*

149. The organization, functions, and duties of the various sections of the staff and the employment and duties of liaison officers are prescribed in FM 101–5.

COMBAT ORDERS

150. The authority to issue orders is an inherent function of command. Orders normally are issued to next subordinate commanders. Bypassing the normal channels of command is resorted to only in urgent situations; in such cases both the commander issuing and the commander receiving the order should notify intermediate commanders of its purpose as soon as possible.

151. Orders should be originated and disseminated in time to permit subordinate commanders the maximum periods to reconnoiter, to estimate their own situations, to issue their orders, and to prepare their troops for the contemplated operation. Commanders must anticipate the delays involved in the successive dissemination of orders.

152. Usually it is desirable to issue an order to warn of impending operations. The principal purpose of the warning order is to gain time for preparatory measures and to conserve the energy of the troops.

153. An order should not trespass upon the province of a subordinate. It should contain everything that the subordinate must know to carry out his mission, but nothing more.

154. Orders must be clear and explicit and as brief as is consistent with clarity. Short sentences are easily understood. *Clarity is more important than technique.* The more urgent the situation, the greater is the need for conciseness in the order. Any statement of reasons for measures adopted should be limited to what is necessary to obtain intelligent cooperation from subordinates. Detailed instructions for a variety of contingencies, or prescriptions that are a matter of training, do not inspire confidence and have no place in an order.

155. Orders which attempt to regulate action too far in the future result in frequent changes. Such frequent changes overload the means of signal communication, cause confusion and misunderstanding, impose needless hardships on the troops, and injure their morale.

156. Orders issued by subordinates should not be mere repetitions of those from higher authority with additions of their own. New orders are clearer and more satisfactory.

157. During the planning stage it usually is desirable to confine knowledge of contemplated operations to the minimum number of commanders and staff officers. As the hour for action approaches, successive echelons of command should be given timely information of the commander's intentions so at the time of entry into action no unit will be in doubt as to its mission or the plan of the higher commander.

158. In every unit, standing operating procedure is prescribed by the commander whenever practicable. This procedure covers those features of operations which lend themselves to a definite or standardized course of action without loss of effectiveness.

159. For details pertaining to combat orders, annexes, and standing operating procedure, see FM 101–5.

COMMAND POSTS

160. The tactical situation usually requires that the headquarters of large units be divided into a forward and a rear echelon. When desirable, headquarters of smaller units may be similarly divided.

161. The forward echelon consists of those staff agencies required to assist the commander immediately in tactical operations. The rear echelon, primarily administrative, consists of the remaining staff agencies.

162. The command post is the location of the forward echelon of a headquarters. All agencies of signal communication center at the command post.

163. A commander frequently places himself forward of the command post, better to observe and direct the action. In such cases, he should be in communication with his command post. He may be accompanied by a small staff.

164. In the selection of a command post, consideration is given to the disposition of troops in the plan of operations, routes of communication, requirements of signal communication, space for staff activities, cover, concealment, and security. Facilities for observation, ground or air, are desirable. In the case of divisions and larger units, the presence of existing wire lines is important.

Remote location of a command post with respect to subordinate units places an unnecessary burden on the means of signal communication, delays the transmission of orders and information, and makes tactical control difficult.

The ability of mechanized units and airborne troops to strike quickly in rear areas indicates the necessity of locating command posts within protected areas. A forward location facilitates control.

On the march, a command post may move by bounds along a designated route, or it may move at a designated place in a column.

165. Frequent changes in the location of the command post are avoided, particularly in large units. Before a change of location is made, the necessary means of signal communication for the new command post *must* be established. This requires that the signal officer be notified well in advance of contemplated changes in command post locations.

166. A commander must keep superior and subordinate units informed of the location and contemplated movement of his command post. Each large unit announces the location of its command post and, when practicable, the general location of the command post of each of its major subordinate units. In rapidly moving situations, it may be necessary to direct subordinate units to select and report the locations of their own command posts. In operations requiring the movement of command posts, each large unit may designate its own axis of signal communication by naming the probable successive locations of its command post, so far as such locations can reasonably be foreseen, and may similarly assign an axis of signal communication to each of its major subordinate units.

167. The *maintenance of secrecy* as to the location of command posts, particularly of large units, is of great importance. They are the special objectives of hostile airplanes, mechanized units, airborne troops, and raiding parties. This threat makes it necessary not only to provide security against surprise attack from either the air or ground, but also to use great care not to disclose their locations to such troops. Concealment from the air is of major importance. Traffic in and out of command posts is rigidly controlled. Landing fields, drop and pick-up grounds, and radio stations are placed at a distance. Signs to mark their locations and the routes thereto are used sparingly. When the danger is great, signs are not used but in their place guides are posted to point the way and messengers are given more precise instructions.

SIGNAL COMMUNICATION

168. The efficient exercise of command and the prompt transmission of information and instructions require the establishment of reliable means of signal communication. Signal communication is effected by technical means and by messengers. Entire dependence cannot be placed upon any one means; alternate means must be provided. (See pars. 64 and 176; also FM 11–5 and 24–5.)

169. Every commander is responsible for the establishment and maintenance of the signal communication system of his unit and for its efficient operation as a part of the system of the next higher command.

170. The establishment and maintenance of signal communication between superior and subordinate units are the responsibility of the superior commander; between adjacent units, as directed by their common superior. A unit supporting another by fire is responsible for the establishment and maintenance of signal communication with the supported unit.

171. The various means of signal communication are employed so that they supplement each other. The means which provide the maximum in reliability, flexibility, secrecy, and speed with the minimum of effort and material will generally be the basic means in a given situation (see pars. 177–182).

172. The command posts and advance message centers are the control points of the signal communication system. When headquarters are in movement, signal communication is maintained between command posts and within columns.

173. *Early information must be given to the signal or communication officer of a unit relative to projected operations and the movement and new location of command posts,* in order to facilitate the prompt establishment of signal communications. The necessary instructions therefor are prepared by the unit signal or communication officer in accordance with the directions of the commander. A communication officer of a higher unit maintains close cooperation with the signal or communication officer of the subordinate unit.

174. *Message centers* are operated by signal communication personnel at all battalion or higher command posts and at the rear echelons of large unit headquarters for the purpose of speeding message transmission. In general, the choice of the means of sending messages, and the cryptographing and decryptographing of messages are the responsibility of the message center. In the case of a message of importance, the writer may confer with the message center in regard to the means of transmission (see pars. 177–182).

The message center transmits messages in accordance with precedence indicated by the writer.

The message center is not responsible for those messages which are—

a. Transmitted directly by the writer to the addressee by telephone or personal agency.

b. Handled by the military or civil postal service.

c. Local messages between staff sections of the same headquarters located at the same place.

d. Handled by the army airway coommunication system.

175. *Advance message centers* are established whenever needed for the reception and relay of messages. Information as to their location must be promptly transmitted to the troops.

Advance message centers are frequently employed in the reconnaissance operations of large units as collecting points for messages of several reconnaissance detachments.

176. *Means of signal communication* include wire, radio, visual and sound communication, pigeons, and messengers.

177. *Wire communication* (telephone, telegraph, and teletypewriter) constitutes the basic technical means of signal communication for the infantry division and the larger unit headquarters. It is not always suitable, however, when forces are operating at a considerable distance from each other. The time required for installation of wire communication diminishes its value in moving situations. Wire communication may fail to function.

Wire communication is susceptible to interception without physical contact and should seldom be used to transmit CLEAR-TEXT CLASSIFIED messages.

178. *Radio communication* is especially applicable in spanning distances between widely separated mobile forces, between ground and air, and in the fire-swept zone of the forward area. It is less vulnerable than wire communication to hostile fire, and is, therefore, a valuable supplement to wire systems in combat. It is subject, however, to static, to willful interference created by the enemy, and to electrical and mechanical failures. Its operational capabilities are affected by terrain features, the weather, time of day, and season of the year. Its use is limited by the number of channels available to a given geographical area.

Enemy interception of all radio messages must be presumed. Discretion must be used even in the sending of messages in code or cipher. When prompt action is called for, the commander must decide whether the urgency of sending the message in the clear outweighs the value to the enemy of information contained therein. Radio transmission in the clear is justified in situations when the time available to the enemy is insufficient for exploitation of the information contained in the message.

During certain phases of operations, use of radio must be rigidly restricted or it may be prohibited by higher commanders.

179. *Visual signal communication* (lamps, flags, pyrotechnics, panels, and airplane maneuvers) is not suitable for long messages or over long distances but finds especial application for communicating within and between small units and with airplanes by a few short signals in accordance with a prearranged code.

180. *Sound communication* (principally horns, bugles, whistles, gongs, sirens, and small arms fire) is used chiefly to spread an alarm, as a means to attract attention, and to transmit short prearranged messages.

181. *Homing pigeons* are a means of communication from front to the rear.

182. In spite of the advances of technical means of signal communication, the messenger system is still the backbone of army signal communications.

The efficiency of the messenger system depends on the individual messenger. He must be chosen for his sturdiness, courage, self-reliance and extreme loyalty.

Messengers are required to transport maps, overlays, and to deliver messages, which require additional verbal clarification. The failure of technical means of communication does not relieve the commander of his communication responsibilities. Messenger communication is needed and used by all units from the smallest to the largest. Scheduled messenger service is established when locations are fixed for a sufficient length of time to warrant the service. Special messengers should always be available at the message center; they are dispatched on special missions as required by the situation. Local messengers serve the units dispersed around the division command post or rear echelon.

Messengers are dispatched by the most efficient means of transport available. In addition to runners, other methods of transportation may include airplanes, motors, bicycles, and animals. Messengers are extremely vulnerable to enemy action. The provision of an armed escort is sometimes required when on or near hostile territory. It is advisable to send important messages by two or more messengers who travel by separate routes. All commanders will assist messengers in expediting delivery of messages.

183. Early signal communication in landing operations is paramount. This requires combat loading of signal personnel with signal equipment and coordination of signal procedure for ground, air, service, and naval forces prior to embarkation.

184. See FM 101–10 for further details.

CHAPTER 6

MILITARY INTELLIGENCE AND RECONNAISSANCE

Section I. MILITARY INTELLIGENCE

GENERAL

185. Information of the enemy and of the terrain over which operations are to be conducted must be evaluated to determine its probable accuracy and, together with other items of information, must be interpreted to determine its probable significance. It then becomes military intelligence.

186. From adequate and timely military intelligence the commander is able to draw logical conclusions concerning enemy lines of action. Military intelligence is thus an essential factor in the estimate of the situation and in the conduct of operations.

187. Military intelligence functions, procedure, and forms are covered in detail in FM 30– series.

COLLECTION OF INFORMATION

188. The intelligence available initially concerning the enemy and the theater of operations is obtained from intelligence studies made by the War Department and furnished the field forces prior to operations. This is supplemented by more detailed information obtained in the field from study of recent maps and map substitutes, captured documents and equipment, hostile and neutral press and radio; from interrogation of inhabitants, repatriates prisoners, and deserters; from reports of agents, air and ground reconnaissance and observation, troops in contact with the enemy, aircraft warning service, and special information services of component units; and from radio direction finding and other sources.

189. The search for information of the enemy is continuous and unremitting and is predicated primarily upon an understanding of enemy capabilities and the careful coordination of all intelligence activities.

190. Collection of military information by subordinate units proceeds in conformtiy with routine procedure, standing operating procedure, and specific orders. Information collected by higher headquarters is transmitted automatically to lower headquarters.

191. The *essential elements of information* consist of that information of the enemy, of the terrain not under our control, of meteorological conditions in territory held by the enemy, or hydrographic conditions needed by a commander in a particular situation in order to make a sound decision and avoid being surprised. The essential elements of information constitute the basis for orders governing the search for information.

In the combat zone the following items are usually included among the essential elements of information: what are the strength, composition, and dispositions of the enemy; what lines of action, which can interfere with our mission, are within the physical capabilities of the enemy; when and under what circumstances can he put each into effect; and whether, when, and in what strength he can be reinforced. The essential elements also include unknown details of terrain which may affect our own maneuver. They may also include items of information desired by higher, lower, or adjacent units, and data on suitable distant objectives for air or mechanized units and on meteorological conditions at or en route to such objectives.

Ordinarily, the military intelligence required by the essential elements of information relating to the enemy is deduced from numerous items of information which serve as indications of enemy action. Reconaissance agencies are directed to search primarily for these indications.

COLLECTING AGENCIES

192. The effectiveness of collecting agencies available to a combat unit vary with its size, facilities available, and distance from the front. The organic collecting agencies of each combat unit are prescribed by appropriate Tables of Organization. Additional collecting agencies may be attached to units which are operating alone.

193. Collecting agencies transmit to the intelligence officer all items of information immediately upon obtaining them, except where it is evident to the agency the information is of a static nature, and can be held for inclusion in a periodic intelligence report.

194. The commander is responsible for all intelligence activities of his unit. He coordinates the activities of the reconnaissance agencies, avoiding duplication of effort by the assignment of missions and objectives and by informing each reconnaissance detachment of reconnaissance to be executed by others. He makes the necessary requests for information to higher and adjacent units.

The commander establishes zones of responsibility for air reconnaissance by designating air boundaries. Air reconnaissance must extend to such distances as to assure against surprise by hostile air or ground forces.

Orders for reconnaissance or observation should state definitely the information desired, where it is to be sought, and the destination and time of reports.

Section II. RECONNAISSANCE

GENERAL

195. *Reconnaissance* is the directed effort in the field to gather information of the enemy, terrain, or resources. It is classified as distant, close, and battle. (See FM 2–15.)

196. The *purpose of reconnaissance* is to gain information upon which to base tactical or strategical operations.

197. *Information concerning the enemy* may include his location, dispositions, strength, organization, composition, movements, attitude, equipment, supply, and morale.

198. *Information concerning the terrain* may include battle positions, character of roads, streams, cover, concealment, and bivouac areas.

199. The *sources of information* are varied and include actual observation of terrain or physical objects, ground and air reconnaissance, and the examination and identification of inhabitants, prisoners, spies, documents, and air photographs. Although reconnaissance missions generally require secrecy of movement, it may be necessary to resort to combat for the purpose of obtaining information.

200. *Ground reconnaissance elements* can maintain continuous contact, operate under weather conditions which preclude air reconnaissance, and can determine details of enemy activity, strength, composition, and combat efficiency. They cannot, however, obtain a complete picture of the enemy situation to any great depth in rear of the hostile screen. They require the cooperation of aviation in order to conserve their combat strength.

201. *Reconnaissance units of horse cavalry,* when available, are of great value on reconnaissance missions because of their ability to execute detailed ground reconnaissance within an appropriate area (see FM 2–5).

202. *Mechanized reconnaissance units* are of great value on distant reconnaissance missions, and for reconnoitering on an extensive front. (See FM 2–7, 2–15, and 17–100.)

203. When adequate reconnaissance elements are not available, a reconnaissance unit consisting of available reconnaissance elements and motorized infantry, or of motorized infantry exclusively, may be employed. It may be desirable to reinforce such a unit with other arms.

204. Close and intensive reconnaissance by infantry, artillery, and engineer units supplements the more distant reconnaissance. *Infantry reconnaissance* assumes special importance when horse or mechanized reconnaissance units are lacking or weak. It is constant and intensive when the opposing forces are in contact and especially during combat.

205. Small *engineer groups* should constitute a portion of ground reconnaissance units to obtain and report information concerning routes of communication and movement, demolitions, land mines, and obstructions.

206. The nearer the approach to the enemy, the more intensive is the reconnaissance. The most detailed information will be required concerning areas of importance in the combat zone Detailed information of the terrain in the possible areas of combat is essential.

207. Effective reconnaissance requires concentration of the available means on missions of importance. Depending on the situation, some reconnaissance elements may be held in reserve to reinforce the reconnaissance which is in progress, or to project reconnaissance in a new direction.

208. Ground reconnaissance elements gain and maintain contact with the enemy and, by working through gaps and around the flanks and the rear, endeavor to ascertain the strength, movements, composition, and dispositions of the enemy's main force, and the approach of enemy reinforcements.

209. Orders for the developments of a command frequently assign zones of reconnaissance to subordinate units. Each unit is habitually responsible for reconnaissance within its zone of advance or action. Flank units are also responsible for reconnaissance on their open flanks.

210. While orders for intelligence activities issued by a large unit may be included in an intelligence annex to a field order, it will usually be necessary to issue part or all of them in fragmentary form.

211. *Air reconnaissance* extends the zone covered by ground reconnaissance and obtains information which will enable ground units to give effective direction to their reconnaissance. Photographs of the areas reconnoitered are of great value to both air and ground reconnaissance agencies.

Under favorable conditions, aviation can furnish early information of the enemy's general dispositions and movements to a considerable depth in rear of his security forces. It cannot provide continuous or detailed information, and frequently its negative information is unreliable, since it is subject to definite limitations resulting from inclement weather, darkness, forested terrain, antiaircraft fire, the activities of hostile combat aviation, and passive measures of antiaircraft defense.

212. *Night visual and photographic reconnaissance* by means of artificial illumination will detect heavy troop and vehicle movements. Reconnaissance flights made shortly after dawn and before dark offer a favorable opportunity for discovery of night movements.

213. The establishment of an effective system of air-ground liaison and coordination is a function of command.

214. Missions to aviation for air reconnaissance of specific roads, railroad centers, and exits of towns and woods must be stated in orders. These objectives are closely observed both day and night to discover the enemy's main forces and reinforcements, and their direction of movement.

215. It is a function of reconnaissance aviation to cooperate with the ground units by the execution of reconnaissance, artillery, and liaison missions. Normally the adjustment of fire for light and medium artillery and the providing of liaison aviation service to field artillery units is accomplished by the employment of organic air observation for field artillery.

EXECUTION OF RECONNAISSANCE

216. Reconnaissance is so executed that contact must be gained at the earliest practicable moment and, once gained, must never be lost. Reconnaissance is a responsibility of all units and is habitually directed to the front and to any open flank. As the situation requires, it is also directed to the rear.

217. Ground forces assigned to reconnaissance missions secure information chiefly through the use of patrols. When, because of hostile activities or the distance of objectives, patrols require close support in the execution of their mission, reconnaissance is executed by detachments which closely back up the action of patrols and furnish reliefs for patrol duty.

218. Terrain features that afford observation of the hostile dispositions constitute special objectives of reconnaissance. Active and aggressive action of patrols in seizing key terrain features is imperative.

219. Weak reconnaissance elements seek to avoid combat unless it is necessary for gaining essential information. If the enemy is superior, the reconnaissance mission is often more easily accomplished by containing the enemy's reconnaissance or security forces in front while pushing reconnaissance around their flanks.

220. Frequently essential information can be obtained only through attack. Reconnaissance units attack when their mission requires it.

221. When hostile resistance is encountered which cannot be penetrated or enveloped, a reconnaissance in force constitutes the best means of clearing up an uncertain situation. Troops engaged in a reconnaissance in force usually make a local attack with a limited objective. The commander who orders a reconnaissance in force must consider the possibility that his intentions or those of the higher commander may thereby be disclosed. He must also be prepared for the possibility that such reconnaissance may bring on a general engagement.

222. Arrangements as to details of cooperation and direct signal communication between air and ground agencies must be made for each phase of operations. The commander of the aviation unit must be informed of the routes of advance of any ground units with which he must communicate, and the locations of command posts, advance message centers, intermediate dropping grounds, and temporary landing fields.

223. To obtain information of the terrain and the existing situation, all commanders should make a personal reconnaissance. Reconnaissance parties are sent forward to obtain detailed information of the terrain and to determine routes and covered areas available for the development of the command; to select assembly areas for the various elements of the command; to select a position for the covering force; to select sites for installation of antimechanized and antiaircraft defenses, land mines, and, when ordered, areas to be gassed; and, if required, to locate the zone of resistance for the organization of the defense.

224. Without orders from the higher commander, each unit executes the reconnaissance necessary to its own operations within its own zone of action and toward any unsupported flanks.

TRANSMISSION OF INFORMATION

225. All subordinates of a command are responsible that their immediate commander is promptly and fully informed of the situation.

226. While a commander who is in need of information from other headquarters is responsible for requesting it, adjacent units should habitually exchange pertinent information regardless of whether or not such a request has been made.

227. Items of information that appear unimportant to a collecting agency should be reported as they may be of significance to a higher commander when considered in conjunction with other information. Negative information is frequently important; likewise, confirmation that the situation during a specific period of time has remained unchanged. First contact with the enemy and new identifications are always reported by the most rapid means available. Other reports of reconnaissance are made as required in orders.

228. Front line troops are frequently so closely engaged in combat that they are unable to report as often as desired by the higher commander. Commanders make provision for obtaining prompt information by special reconnaissance and by sending liaison agents to higher, subordinate, and adjacent units. These provisions do not relieve subordinate commanders from making every effort to keep their superiors fully informed of the situation.

229. The best information will be of no use if it arrives too late at the headquarters for which it is intended.

230. Important and urgent information, in addition to being transmitted to the next higher commander, is sent by the most rapid means available to all headquarters affected, without regard to the usual military channels.

231. Artillery observers and liaison officers are often in a position to transmit to the higher commander over their own signal communication systems early reports of important combat events when such information might otherwise be delayed in transmission.

232. The commander provides signal communication channels to expedite the transmission of information obtained by reconnaissance elements and requires signal communication personnel to transmit promptly and accurately the results of reconnaissance missions.

233. During pauses in combat, or whenever the situation demands, subordinate commanders make brief intelligence reports to the next higher headquarters. Periodic reports are made as ordered by the higher commander.

234. As required by the situation, military intelligence is disseminated to subordinate units in field orders, messages, or copies of periodic or special intelligence reports. The means of dissemination must be appropriate to the time available.

235. The methods of reconnaissance employed by the several arms are described in their respective Field Manuals.

CHAPTER 7

SECURITY

GENERAL

236. *Security* embraces all measures taken by a command to protect itself against annoyance, surprise, and observation by an enemy.

237. The primary mission of a security detachment is to protect the command against surprise attack and observation by hostile air and ground forces, and to maintain freedom of maneuver for the command by gaining the time and space it requires to make the necessary dispositions. Security is always necessary, whether in movement, at the halt or in combat. In bivouac and in movement, security is provided in all directions. Forces assigned to security missions are secondarily charged with reconnaissance.

238. Adequate and timely information is the basis of all security measures. Continuous reconnaissance is therefore an essential part of security.

239. Security and reconnaissance forces operate in accordance with different considerations. In general, security forces operate primarily with reference to the command to be secured; reconnaissance forces operate primarily with reference to the enemy.

240. Reconnaissance influences security by indicating to the commander the measures to be taken to protect his forces. Information furnished through reconnaissance is a guide to the commander for determining the strength, composition, and disposition of his security detachments.

241. Each commander is responsible for the security of his command. This includes the protection of his lines of communication unless such protection is furnished by the higher commander. The superior commander prescribes security measures for the protection of the command as a whole or coordinates those adopted by subordinate commanders. He insures that measures adopted are appropriate to the hostile threat. Subordinate commanders provide additional security required for their own local protection. When contact is imminent, security measures are increased.

242. All security measures include an adequate warning system consisting of observers and the means of signal communication to warn promptly of hostile dispositions and operations on the ground and in the air. Special measures are taken to warn of the approach of hostile mechanized or air forces.

243. *Security detachments* weaken the available forces of a command and in some situations constitute a partial commitment of the command to action. They are given sufficient strength to preserve the commander's freedom of action, and no more. In their composition, consideration is given to the desirability of preserving tactical unity. It is desirable that they possess mobility at least equal to that of the forces they are expected to oppose.

244. An advancing force secures itself to the front by mobile reconnaissance elements sent out in advance of the command and by an advance guard.

Depending upon the composition of the command, the mobile reconnaissance elements vary from armored units, cavalry, and aviation, in the case of large units, to small cavalry detachments, motorcyclists, or men in trucks in the case of small units.

The advance guard consists of a fraction of the command sent out on the route or routes of advance in front of the main body to protect it against surprise and observation; to clear the way by driving back weak enemy forces, by removing obstacles, and by repairing bridges and roads; and to secure for the main body the time and space required for its deployment for action in accordance with the plan of the commander. (For details, see ch. 9.)

245. A command moving within the theater of operations secures itself by a rear guard, a fraction of the command which follows the main body in the zone of march, usually by bounds, for the purpose of protecting it from attack observation or interference by hostile ground forces. (For details, see ch. 12.)

246. In addition to its advance or rear guards, a command whose flanks are not protected by adjacent units will often find it necessary to detail flank guards to protect the exposed flanks (see ch. 9).

247. A resting or defending force secures itself by an outpost, a fraction of the command disposed to cover its front, flanks, and rear, to protect it against surprise attack and observation by hostile ground forces. (For details, see ch. 8.)

248. There is a similarity in the formation of advance, flank, and rear guards and outposts. Each comprises reconnaissance groups which send out patrols or post sentinels for observation. These reconnaissance groups are backed up by a support echelon, the principal element of resistance. In large security detachments, a reserve is provided. The reserve consitutes the principal maneuvering and reinforcing element for offensive or defensive action as determined by the mission of the security detachment, which mission in turn depends upon the plan for the subsequent employment of the command as a whole.

249. An echelon of command which depends upon another for security to its front, flanks, or rear is responsible for maintaining contact with the unit upon which it depends. This is accomplished by means of liaison agents which it sends to the unit upon which it depends and by means of combat patrols which move between the two to maintain contact.

SECURITY AGAINST MECHANIZED FORCES

250. *Terrain* and the road net influence the employment of mechanized forces. A map study, supplemented by air and ground reconnaissance, will disclose avenues of approach which may favor or impede mechanized operations. A skillful use of natural barriers, properly strengthened and protected, affords the best antimechanized defense. However, reliance for protection against mechanized attack cannot be placed on terrain alone. When approaches are favorable, special measures are taken for antimechanized protection, especially by exposed march columns.

251. Security against mechanized units requires an efficient warning system which includes an intelligence and a signal communication system carefully coordinated to insure early and continuing information of the presence and action of hostile mobile forces. Timely warning permits an increased readiness for action. Mechanized reconnaissance detachments operating well to the front and flanks are especially suitable for giving warning. All ground observation and reconnaissance agencies are required to make an immediate report of a mechanized threat to the nearest commander by the most expeditious means available. In addition to security measures adopted by a command as a whole, subordinate units conduct local reconnaissance to prevent a surprise mechanized attack.

252. The means of protection against mechanized attack are active and passive. The active means include antitank guns, artillery, combat aviation, antiaircraft artillery which is capable of firing at horizontal or minus elevations, tank and tank destroyer units, chemicals, and individual weapons to the limit of their effectiveness. Passive means include reconnaissance, concealment, cover, natural and artificial obstacles, buildings, demolitions, antitank mines, and organized localities. Usually active and passive means are used in combination.

253. Security against mechanized attack must be organized from two standpoints: the local protection of the troops and the protection of the command as a whole.

The first is the mission of the antitank weapons organically assigned to lower units.

The second is the mission of the tank destroyer units at the disposal of the higher commander. These units, because of their great mobility, are available for employment at a distance from the command or for concentration at the decisive locality. Mobile units capable of effective employment against mechanized forces are held for maneuver against hostile mechanized vehicles which succeed in breaking through. To insure the prompt transmission of information and orders to units, arrangements are made for rapid means of signal communication with them.

254. The coordination of the means of antimechanized protection is a command responsibility. Commanders of subordinate units are given missions for antimechanized defense which are specific with respect to time, place, purpose, and cooperation with other units, but which leave to them the details of execution (see ch. 11).

SECURITY AGAINST CHEMICALS

255. It is the responsibility of each commander to take measures to provide security for his command against chemical agents.

256. The means of providing security against chemical attack consist of an adequate warning system, the provision of individual and collective protective equipment, provision for the prompt decontamination of individuals, equipment, and supplies, and tactical measures which minimize the effects of chemical agents.

257. An adequate warning system comprises reconnaissance to locate and define contaminated areas, gas sentinels, and an alarm system to alert the command when a chemical attack begins or impends.

258. *Individual equipment* consists principally of gas masks and protective clothing. Men must be trained and disciplined in the use of this equipment. Failure in this respect results in excessive casualties and incurs the danger of panic.

259. *Collective equipment* includes gasproof shelters, or protective covers for equipment and supplies, and decontaminating equipment and supplies. Gasproof shelters are provided in all permanent fortifications; their use in field fortifications increases with the elaboration of the field fortifications.

Prompt decontamination of individuals, equipment, supplies, and occupied areas reduces casualties and losses of equipment and supplies.

260. *Tactical measures* include troop dispositions which take advantage, as far as practicable, of terrain unfavorable for gas concentrations and the avoidance or evacuation, to the extent possible, of gassed areas. Alternate positions for units and supporting weapons are selected in advance.

261. Regardless of the effectiveness of the security measures taken by the higher command through the offensive action of its combat aviation, all units must consider the probability of air attack and reconnaissance and provide appropriate security measures.

262. *Measures* taken by ground troops for antiaircraft security vary with the situation, the degree of visibility, the concealment and cover offered by the terrain, and capabilities of the enemy's aviation. Protective measures comprise warning, concealment, dispersion, and fire.

263. The first requirement of antiaircraft security is an efficient warning system. Air guards are detailed by all units to give timely warning of the approach of hostile aviation. In addition, an aircraft warning service is, whenever practicable, organized within an area for the purpose of detecting and tracing movements of hostile air forces and transmitting warning of the approach and departure of such forces.

264. Upon receiving an air alarm signal, troops in position, bivouac, or billets seek the nearest concealment or cover and remain motionless. In general, foot troops on the road deploy and seek cover. When time of warning permits, troops will deploy off the road and continue the march. Motorized troops continue the march. Horse elements seek protection by dispersal and the utilization of all available concealment and cover.

265. When the situation indicates the necessity for continued movement and a command is subjected to frequent air attacks, maximum advantage is taken of dispersion and available concealment and cover without unduly delaying the movement. Troops must be prepared to accept some casualties rather than delay arrival at their destination at the appointed time.

266. Measures taken for concealment aim to defeat both visual reconnaissance and air photography. Protective measures taken to defeat the camera will ordinarily deceive the eye of the air observer.

The presence and position of troops are disclosed to an air observer by movement, by regular formation or outline, by reflection of light, or by dust, smoke, or newly made tracks and intrenchments. All commanders are required to take appropriate countermeasures to prevent detection.

267. Shadows cast by the sun early in the morning and late in the afternoon facilitate concealment. Ground haze or mist may constitute an effective screen against air observation. A low ceiling makes air reconnaissance dangerous for the air observer. During darkness, blackout frequently provides effective concealment.

Woods and villages afford concealment from air observation and reconnaissance; they serve to screen troops in shelter, in assembly, in position, and in movement.

Intrenchments and field works are visible from the air unless carefully sited and camouflaged. Protection is sought by the distribution of the defenses on the terrain and by their adaptation to concealment and cover such as buildings, brush, hedges, banks, ditches, and cuts.

268. A command diminishes its vulnerability to air observation and attack by adopting dispersed formations. Dispersion in formation may be accomplished by increased width and depth of disposition, by reduced density within columns or groups, and by increased speed in movement between successive terrain lines affording concealment or cover

269. The antiaircraft security of a column depends initially on the efficacy of the concealment in its last bivouac. During a movement, the important periods during which antiaircraft security must be provided are the formation of the march column, the passage of defiles or crossings en route, and the movement into shelter or assembly positions at the end of the march. During temporary halts, troops and vehicles clear the road and take full advantage of all nearby cover.

270. At night, special precautions must be taken against reconnaissance by hostile aviation using flares. When a unit is illuminated it halts and remains motionless. No lights visible to air observers are permitted to be used by troops and vehicles.

271. All units take measures for immediate protection against low-flying aircraft by using their own weapons which are suitable for fire against aircraft. All troops charged with this duty are constantly prepared for immediate action. but will fire only upon order of an officer or responsible noncommissioned officer. No aircraft will be fired upon unless it has been clearly recognized as hostile or is positively identified as hostile, or attacks with bombs or gun fire. Commanders of all echelons personally are responsible that the above restrictions are observed.

272. The antiaircraft fire of other units reinforces the fire of antiaircraft artillery which operates especially against aviation flying beyond the effective range of weapons of other arms.

273. In the forward area of the combat zone, antiaircraft artillery protects forward airdromes, principal troop concentrations, and assembly positions, and covers the movement of troops through defiles and critical localities. Driving hostile aviation to higher altitudes decreases the effectiveness of air attack and observation. Since antiaircraft artillery automatic weapons will be handicapped in giving protection at night, additional dependence must be placed on passive measures. (See pars. 417 and 614.)

274. In the rear area, antiaircraft artillery cooperates with friendly aviation in protecting important establishments from air attack.

275. The threat from troops transported by and landed from aircraft requires that special security measures be instituted against them. Responsibility for these measures extends down through all echelons of command, the measures adopted within each echelon being coordinated in such a way to provide a unified system over the entire danger area. In general, the security measures adopted are designed to gain early information, to attack incoming enemy transports by combat aviation and antiaircraft fire, to destroy parachute troops while in the act of landing or immediately afterward when they are most vulnerable, to obstruct all possible landing fields not required for friendly air operations (airdromes, open fields, and straight stretches of level highway), and to isolate and destroy all landing forces by immediate attack before they can be resupplied and reinforced with supported weapons. Defensive measures must not be reduced to routine; routine will assist the enemy in gaining surprise.

COUNTERRECONNAISSANCE

276. *Counterreconnaissance* includes measures to screen a command from hostile observation. It is executed principally by aviation, antiaircraft artillery, cavalry, armored units, and security detachments. The commander coordinates the action of all of his ground force counterreconnaissance agencies by assigning to each a mission in accord with its capabilities. The air force commander will coordinate his forces in a similar manner, maintaining close liaison with the ground forces commander.

277. Bombardment aviation contributes materially to counterreconnaissance by attacking hostile airdromes. Fighter aviation, employed for counterreconnaissance on fronts where it is important to conceal our own activity from hostile air reconnaissance, attacks all hostile aviation. Complete elimination of hostile air reconnaissance cannot be expected. Where secrecy is desired, ground forces must conceal their movements and dispositions.

278. Combat aviation in counterreconnaissance is supplemented by antiaircraft artillery and the weapons of other units. Subject to the desirability of maintaining secrecy, all hostile aviation within range is fired upon to prevent observation. Before the fire of antiaircraft weapons is resorted to, consideration must be given to the fact that such fire may disclose the importance of the area being screened.

279. Units assigned counterreconnaissance as their principal mission seek to defeat or neutralize hostile reconnaissance forces. In the execution of this mission, they operate offensively, defensively or by delaying action, resorting to all forms of combat when necessary.

Offensive counterreconnaissance is most effectively executed by the defeat of the hostile reconnaissance forces. The activity of hostile patrols is most completely eliminated by the defeat of the stronger supporting detachments.

Defensive counterreconnaissance is most effective when the screen can be established behind an obstacle which must be crossed by hostile reconnaissance forces. Elements are employed to obtain information, attack advanced enemy detachments, or obstruct their operations.

When a broad front must be covered, it may be necessary to resort to delaying action to impede temporarily the operations of hostile reconnaissance forces.

Aviation assists counterreconnaissance by attacking hostile aviation attempting to cross the zone of counterreconnaissance and by reporting hostile ground movements, especially the approach of highly mobile units.

280. The counterreconnaissance screen may be either moving or stationary. A moving screen is applicable to situations where the movement of a force must be screened; a stationary screen is used to screen the dispositions or concentration of troops or prevent the enemy from reconnoitering an area. (See FM 2–7, and 17–100.)

COUNTERINTELLIGENCE

281. The object of *counterintelligence* is to destroy the effectiveness of the enemy intelligence system.

Counterintelligence measures available to a command include secrecy; discipline; concealment; tactical measures designed to deceive the enemy; restrictions on the preparation, transmission, and use of documents; signal communication security; precautions in the movements of troops and individuals; regulation of the activities of newspaper correspondents, photographers, radio news commentators, and visitors; censorship; counterespionage, and counterpropaganda. (See FM 30–25.)

282. It is imperative that all members of the military service realize that thoughtless or talkative persons may become a menace to their country and to the lives of their comrades. Officers, enlisted men, and civilian employees must not discuss military instructions, plans, operations, movements, or the composition or location of troops in the presence of civilians or other unknown persons. In making preparations for operations, it frequently will be advisable to take special precautions to maintain secrecy. Secrecy precautions must not jeopardize the success of operations by withholding information necessary to the forces involved.

283. All members of the military service should understand that if they are captured the enemy will make every effort to obtain information from them. They will be instructed to give correctly their name, rank, and serial number, and maintain absolute silence when asked any other questions. Any other information given may prejudice the success of operations and endanger the lives of their comrades.

284. Troops should make maximum use of natural and artificial concealment. Natural concealment and cover should be supplemented by camouflage. Since photographs frequently disclose things not visible to an observer's unaided eye, commanders should prevent the making of trails, tracks or other telltale marks in the vicinity of any work. In general, it is useless to attempt to camouflage a position where work has already been begun which the enemy has had an opportunity to observe and register.

In general, troop movements in the combat zone should be made under cover of darkness and with restrictions on the use of lights. If the enemy possesses a powerful air force, a blackout system must be employed. Under favorable conditions, smoke can be placed over restricted areas for limited periods of time to conceal information of great importance.

285. A commander who is ingenious and resourceful in the use of tactical stratagems and ruses will often find methods of deceiving or misleading the enemy and of concealing his own intentions.

Feints, demonstrations, and simulated concentrations may be employed to mislead the enemy regarding the strength, time, or place of attack. The main attack may be accompanied or preceded by secondary attacks made in such a manner as to conceal the location of the main attack. A carefully screened withdrawal may be employed to deny the enemy the choice of the time and place of attack. Marches by day and return at night and the movement of empty truck columns have been employed to create the impression of great activity. Fake concentrations; simulated bivouacs, airdromes, and radio installations; dummy field fortifications, artillery positions, tanks, and airplanes; and many other such means have been successfully employed. It often is practicable to deceive the enemy regarding our plans and intentions by changing any routine procedure which may have come to his attention.

The dissemination of false information designed to deceive or mislead the enemy as to our intentions, capabilities, morale, or dispositions, such as, for example, the deliberate loss of orders or prisoners always introduces an element of danger because our own plans and decisions are apt to be influenced by the assumption that the enemy has been deceived. Such measures may be adopted only by the theater commander or by his authority.

286. Counterreconnaissance is employed on fronts where it is especially important to conceal the disposition of troops from hostile investigation.

287. Precautions are taken in the safeguarding and transmission of secret, confidential, and restricted documents. All orders, pamphlets, maps, diagrams, publications, or manuals and similar matter, except messages, originating in the theater of operations are classified as *Restricted* unless given a more restrictive classification. Military personnel in the front lines, on reconnaissance, or on missions over the enemy's lines, will not, under any circumstances, have in their possession any documents, except those absolutely necessary for the execution of their missions.

288. Secrecy in the transmission of messages is of the utmost importance. Commanding officers are responsible for the maintenance of signal security within their commands. The signal intelligence service is responsible for the surveillance of friendly signal communication. The use of codes and ciphers is restricted to personnel specially trained in cryptography.

289. Before leaving a camp, concentration area, rest area, bivouac. or any other assigned area in the theater of operations, troops will make a systematic search of the area to insure that no documents or other evidence of potential intelligence value to the enemy remains.

290. The objects of censorship are to prevent information of military value from reaching the enemy, to insure that only accurate accounts of military activities are published or broadcast and to maintain friendly relations with allied and neutral nations.

CHAPTER 8

HALTS AND SECURITY DURING HALTS

HALTS

291. Halts are made to rest troops after marches and to prepare for subsequent operations. Security, comfort of troops, and future operations influence the selection of the location for a halt.

292. Considerations governing halts during a march are set forth in chapter 9.

SHELTER

293. In the theater of operations, troops are sheltered in billets, bivouacs, camps, or cantonments. (See FM 100–10.)

294. The situation and probable future action dictate the distribution of troops in shelter areas.

When contact with the enemy is remote, march considerations and comfort of the men govern dispositions for the halt. In large units, troops are sheltered as close to the route of march as practicable and are distributed in depth to facilitate shelter and supply, and the anticipated order of march.

When contact with the enemy is probable, tactical considerations govern the distribution of troops. Frontages are increased but units remain echeloned in depth with all around security. Trains and units lacking adequate self-defense are concealed and dispersed in protected areas, generally well to the rear, or with troops equipped for defense.

295. During pauses in combat, troops, while prepared for all around defense, rest in position on the ground held.

296. Based on ground, photo, or map reconnaissance, the commander selects and announces the shelter areas at the earliest possible moment. Quartering parties from each unit then proceed to the assigned areas to apportion, mark, and provide guides for the new areas so that units may march directly thereto without halting or congesting the main routes.

OUTPOSTS

297. An *outpost* is a security detachment to protect a resting command or a defensive position against annoyance, surprise, and observation by ground forces.

298. Enemy capabilities, terrain, and the location of the main body determine the location and nature of the outpost.

299. A resting command provides all around outpost protection so disposed as to insure antimechanized, antiairborne, and antiaircraft security; to control roads; and, if practicable to deny artillery observation posts to the enemy.

300. The strength and composition of an outpost vary with the distance, mobility, armament, and attitude of the enemy; the terrain; the time of day; the size of the command to be secured; the degree of resistance desired; and the special tasks assigned. An outpost should be no stronger than is consistent with reasonable security.

Patrols in close contact with the enemy and resisting detachments on avenues of approach provide economical protection.

In close terrain and during periods of darkness or low visibility, security forces are usually stronger and closer to the main body.

An outpost may comprise varying proportions of the following arms:

Infantry, generally the principal element with a high proportion of automatic and other infantry supporting weapons.

Artillery, to support outpost infantry.

Engineers, to lay mine fields and construct other barriers.

Tank destroyer units, to destroy hostile tanks.

Cavalry, to extend the zone of reconnaissance or to maintain contact between adjacent units.

301. The outpost of a large command is divided from rear to front into reserve, supports, outguards, sentinels, and when cavalry is attached, outpost cavalry. When important points to be secured lie outside the sectors of the supports, detached posts are established.

302. The general mission of each outpost element is to give warning and gain time for forces behind it.

303. The missions of the reserve are to reinforce the troops in front, to counterattack, or, if the outpost has been given a delaying mission to take up a position covering the retirement of the supports.

304. *Supports* constitute the principal echelon of resistance of the outpost. They provide their own security and the observation service of the outpost by establishing outguards and sending out patrols. They are placed at the more important points dominating or controlling the approaches into the outpost area. A support is generally placed near a road. Each support is assigned a sector which is clearly defined by recognizable boundaries. Supports vary in strength from a platoon to a company. Machine guns and other supporting weapons are attached to supports as required. Supports are numbered consecutively from right to left.

305. An *outguard* varies in strength from four men to a platoon, depending on its location and the number of sentinels it is to furnish. Posts at a short distance from the support may be held by weak outguards while important posts at a considerable distance must be held strongly. Outguards are numbered consecutively from right to left in each support. (See FM 7–20 and other appropriate manuals.)

Outguards must be ready for action at all times. When in close contact with the hostile outposts, the establishment of listening posts at night in front of the general line of observation is advisable.

306. *Sentinels* to observe the foreground of an outpost position are furnished by the outguards. These sentinels have the mission of discovering hostile activity, giving the alarm in case of attack and carrying out other orders specifically prescribed for their posts. Sentinels are generally posted in pairs.

307. *Detached posts* are established at critical points located beyond the limits of any support sector. The size and composition of a detached post may vary between wide limits depending on terrain and on the situation.

308. Outposts conduct reconnaissance within the limits required by their security mission. More distant reconnaisance is conducted by the higher commander.

309. *Patrols* execute reconnaissance in advance of the line of sentinels and in areas not covered by sentinels. Patrols also maintain contact between elements of the outpost.

310. Patrolling in front of the line of observation is increased at night or during periods of low visibility. Night patrolling requires systematic organization, careful preparation, and the coordination of advanced outpost elements with the activity of the patrols.

311. *During an advance,* the outpost established at halts is usually furnished by the advance guard. A new advance guard usually is designated when the movement is resumed. The outpost ordinarily stands relieved when the support of the advance guard passes the outpost area.

312. During *a retrograde movement,* the outpost usually furnishes the rear guard, a new outpost being posted from the main body when the command completes the day's march.

313. *When the command remains stationary* for a prolonged period, the outpost ordinarily is relieved at intervals of several days.

314. The *halt order* of the commander of the troops assigns locations to the elements of the command, designates the position to be held in case of attack, and contains instructions relative to security. This order either provides for an outpost under centralized control by naming the outpost commander and detailing the outpost troops or it requires column commanders to organize outposts for their commands In either situation, the commander of troops designates the general line to be held and the limits of the front to be covered by the outpost system. He indicates what action the outpost is to take if it is attacked in force, outlines special reconnaissance to be executed, indicates the approaches which are to be especially guarded, and regulates the signal communication to be established between adjacent outposts.

He may direct the establishment of detached posts by the main body or by the outpost commander.

315. The elements of the outpost conceal their locations and movements from ground and air observation. They prepare their positions for all around defense. They make the maximum use of long-range interdiction fires by artillery and automatic weapons. They attempt to deceive the enemy as to the true disposition of the main body.

CAVALRY AND MECHANIZED OUTPOSTS

316. *Cavalry and motorized or armored units* secure themselves by far-reaching reconnaissance and by depth of their dispositions in the bivouac area.

When at a distance from the enemy and not protected by other troops, they send out security detachments (companies, platoons) to hold critical points on the routes of approach from the front, flanks, and rear. These detachments preferably are posted along some protective terrain line that the enemy will be forced to pass in his advance (defiles, streams, crossings) and provide for their own security by posting out-guards and sending out patrols. Additional outguards are posted near the main body.

In close proximity to the enemy, security measures approach a more continuous outpost organization. When the security troops occupy an extensive front, outpost sectors are assigned to the various security detachments. When necessary, portions of the main body are held in readiness for immediate action. The mobility of a motorized or mechanized unit permits the location of its outpost at some distance from the main body. When there is danger of attack, increased readiness for action is obtained for outguards and supports by having animals and vehicles ready for movement.

SECURITY MEASURES WITHIN SHELTER AREAS

317. Security in a shelter area is obtained by active and passive measures.

318. An *interior guard* is established to defend especially valuable matériel such as guns or aircraft, to give the alarm in case of air, airborne, ground, or gas attack, and to enforce traffic, police, and camouflage discipline.

In hostile territory, interior guards are made stronger. Guards for bridges and railway stations, searching parties for enemy wire and radio installations, holding of hostages, closing roads to civilian traffic, and other special security measures often are necessary.

319. *Antitank and antiaircraft weapons* are emplaced. Antiaircraft weapons should not reveal the location of a concealed bivouac by premature fire.

320. A highly mobile, aggressive force should be designated to provide antiairborne security.

321. One officer at each headquarters and in each company or similar unit and one noncommissioned officer in each platoon are constantly on duty to alert the command in case of attack.

322. The area commander designates a rallying position and the route thereto for each subordinate unit. Intermingling or crossing of units is avoided.

323. *Passive measures* are concealment, camouflage, dispersion, and cover. Individual cover is provided by digging fox holes. All troops should be impressed with the necessity of individual camouflage protective measures.

324. To alert all the troops, the alarm is sounded. If the area commander decides to alert only certain troops, he notifies them by quickest means available.

325. When alerted, each unit assembles and reports its readiness to the commander. In an alert, quiet and order are maintained. Each man must know where to go and what to do.

326. On the approach of hostile aviation, the interior guard sounds the alarm if danger is imminent. All troops take the prescribed antiaircraft measures.

CHAPTER 9

TROOP MOVEMENTS

GENERAL

327. Troop movements are made by marching (by foot, animal, or motor), by rail, by water, by air, and by various combinations of these methods. The method to be employed depends upon the situation the size and composition of the unit to be moved, the distance to be covered, the urgency of execution, the condition of the troops, and the availability, suitability, and capacity of the different means of transportation.

328. For the organization of systems of transportation. and circulation and control of traffic in the theater of operations, see FM 100–10.

329. For technical and logistical data pertaining to troop movements, see FM 101–10.

330. *Motor transportation* is employed extensively to increase the mobility of foot troops and conserve their strength. Air transportation is used for the movement of troops for special purposes.

331. A successful march places troops at their destination at the proper time and in effective condition for combat. It is the task of commanders to reconcile the conflicting requirements of rapidity of movement and conservation of fighting power.

332. The ability of a command to achieve decisive results on the battlefield depends in a large measure upon the marching capacity of the troops. While mechanical means of transport are employed extensively for troop movements, sustained mobility on or near the battlefield requires that all troops be thoroughly conditioned to march exertions; therefore, from the first days of training, advantage is taken of every opportunity to perfect troops in marching.

333. Special attention to the care of troops and the means of transportation is essential to successful marching. Commanders take the necessary measures prior to a march to place men, animals, and transportation in the best possible condition and exercise the necessary supervision during and after the march to maintain them in that condition. Troops are not kept in column nor under arms any longer than necessary. Full use is made of available transportation to carry the rolls of the troops and the equipment and loads of the animals in need of relief.

334. Food and drink obtained from local sources are regarded as contaminated and consumption is prohibited until approved by proper authority.

335. Extremes of weather constitute one of the greatest sources of hardship on a march. Thorough familiarity with provisions of FM 21–10 is therefore incumbent on all concerned.

MOVEMENT BY MOTORS

336. The ability of a command to concentrate superior forces quickly at the decisive place and time will often depend upon its skill in the use of its organic motor transportation. Whether the normal loads of motor vehicles are advanced before or after the foot troops depends upon the nature of these loads and the tactical situation. The amount of organic transportation which prudently can be diverted from its normal purpose to move foot troops depends upon the degree of readiness for combat required by all or part of the command, the supply requirements, the hazard of immobilizing essential loads at a critical time, and the consequence of possible disorganization of the command by enemy action. Except for vehicles issued for the movement of active weapons such as prime movers or weapons carriers, all trucks of any unit are considered as a pool of transportation to be used as required.

337. The distance moved is largely dependent upon the time required to complete the movement, the enemy's capabilities to interfere with the movement, and the cover and terrain suitable for the assembly, detrucking, and deployment of the main body. The time required to complete the move is affected by the number and condition of roads; distance between entrucking and detrucking areas; vehicular speed maintained; number of trips required; time-length of columns; delay caused by enemy interference or other obstructions; the time-lag between the issuance of orders and the beginning of execution; and the time consumed in loading and unloading personnel and equipment in turn-arounds.

338. In the execution of movements, a commander divides his command into tactical groupings which are moved successively by furnishing them with additional transportation obtained either from other elements of the command or from units whose movement is deferred, or by initially organizing each group so that it has the transport means to move itself in two or more trips.

As far as practicable, each tactical grouping is composed of the same type of units. It should include the units (combat teams) normally associated in combat, and the organic weapons, ammunition, and rations of such units, so that each tactical grouping will constitute a complete fighting force.

339. Foot and motor movements may be combined. Foot troops may march from the initial point while awaiting their transportation, or may be detrucked short of their destination.

340. Preparations for and the conduct of movements by successive trips are greatly faciliated by the adoption of standing operating procedures. Otherwise the plans and orders for such movements are so time-consuming in their preparation as to nullify the potential mobility of the command.

341. When combat is probable, special attention is given to the protection of the detrucking area, to the composition of the tactical grouping moving in the first trip, and to the security of the zone of movement between the separate elements of the command.

TACTICAL CONSIDERATIONS

342. The factors which exercise the greatest influence upon dispositions for marching are the composition and proximity of the hostile ground forces and the activity of hostile aviation. Distance no longer gives to armies the same degree of protection and freedom of action as in the past. When the hostile forces include mechanized elements contact with such elements should be expected from any direction not protected by friendly forces or terrain barriers.

When contact with enemy ground forces is remote, the principal object of march disposition is to facilitate and expedite the movement of troops and to conserve their energy. Commanders make use of the available motor transportation for moving foot troops. As far as practicable, columns are composed of units having the same rate of movement. Separate roads are assigned to columns having different rates of movement, or their movements by the same road are echeloned in time.

When contact with the enemy is probable, tactical considerations govern march dispositions. Columns are constituted in accordance with their tactical missions. Adequate provisions are made for security.

Service troops and kitchen and baggage trains may be held in a protected area and moved forward under cover of darkness.

343. A large unit advancing against the enemy is assigned either successive objectives or a direction of movement, and either a zone or routes of movement.

A large unit whose zone of movement includes several routes assigns routes or zones to its component units in accordance with its plan of maneuver.

344. *When the enemy main forces are distant,* a large unit usually moves in a broad and deep formation in order to retain the power of maneuver and to achieve the rapidity of movement essential to the initiative. Reconnaissance troops reconnoiter the assigned zone of reconnaissance and gain contact with the hostile forces. Security against motorized and mechanized forces is provided in the zone of reconnaissance through the successive seizure of road centers and natural terrain lines by the aggressive action of mobile detachments operating well to the front and on unsupported flanks.

345. *With the closer approach to the enemy,* the zone of reconnaissance becomes less extensive and less time is available to prepare for action. Readiness for combat requires a diminution in the depth of the formation. Columns are constituted in accordance with tactical missions.

346. Commanders dispose their tactical groupings in order to permit flexibility of maneuver and readiness for deployment in the direction of the enemy.

A *formation in depth* provides maximum flexibility of maneuver but delays deployment. It is the easiest of all formations to control, enables the commander to exert the maximum influence in coordinating the action of the forces initially engaged, and assures the availability of units intended for maneuver.

A *formation in width* increases readiness for deployment in the direction of movement. Maneuverability is restricted, especially after gaining contact; changes of direction are difficult.

A formation in which columns are echeloned to a flank facilitates maneuver and deployment to that flank and retains to varying degrees the advantages and disadvantages of both linear and columnar formations.

The commander's movement order prescribes the time and place of departure of his columns so as to produce the desired formation and includes such instructions pertaining to subsequent coordination as can be foreseen.

Movements may be controlled by prescribing the hour when the head of the main body of the respective columns will continue the advance beyond the designated terrain (phase) lines. These intermediate objectives may be prescribed in the order or during the movement. Column commanders report promptly when these objectives are reached and at other designated times. The imminence of contact with strong forces prepared for battle, the probable inequality in progress of the several columns, and suitable terrain affording concealment, cover, and tactical advantages largely determine the length of bounds.

Control of the movement may also be obtained without the designation of phase lines. Under this procedure, subordinates furnish periodic position reports and the commander issues his orders during the movement.

347. When contact with strong forces prepared for battle is imminent, the commander assures himself of continued possession of terrain suitable for subsequent maneuver and prepares his command for combat. He coordinates further advance by prescribing terrain lines that will be seized by the advance guards while the main bodies of the respective columns are suitably disposed for combat within supporting distance. After a march has begun, variations in echelonment are regulated by halting certain columns or by changing the duration of their rest periods.

348. In an advance, *commanders and their staff parties* are well forward. The commander goes where he best can control the operation, usually with his principal column or with the column along which the axis of signal communication is being established. Ordinarily, the commander and his staff party move by bounds to successive locations where messages may be received and sent. He may be accompanied by one or more of his principal subordinate commanders.

349. *Signal communication* between columns and with the superior commander is regulated ordinarily by standing operating procedure, supplemented as necessary by special instructions. Ordinarily the means employed are messenger and vehicular radio. Liaison airplanes may be used to maintain contact between columns and to report their arrival at successive march objectives. Full use is made of existing commercial signal communications systems.

350. A column comprises its security detachments, the main body, and the trains. The formation and movement of each of these groupings are regulated by a designated commander in accordance with instructions of the column commander. Distance between the groupings is regulated by the column commander.

The maintenance of roads and the removal of obstacles require the presence of an engineer unit with the advance guard or near the head of each principal column.

351. The *order of march* of a column of all arms advancing against the enemy is dependent upon the terrain, the tactical situation, the mission of the column, and the relative mobility of the component units.

The order of march of security detachments ordinarily is prescribed by their respective commanders. The column commander prescribes the order of march of the main body.

352. When contact with the enemy is possible, the order of march of a column composed of elements of approximately equal mobility is adapted to the requirements of security and to the probable order of entry of units into action.

Artillery is placed within the column in order to insure its protection but primarily to insure its availability for early and adequate support of the security forces and the initial action of the main body.

Antitank weapons must be disposed and employed in order to provide protection to the moving column. Antitank weapons are attached to security detachments.

Motor vehicles required in the exercise of command and control of the column ordinarily advance by bounds in the interval between the main body and the security detachment. Other motor elements pertaining to staff parties march at the head of their units.

Trains are so placed in the column as to be available to their units when required. Trains not immediately required may be held in protected areas in rear and sent forward when the situation permits.

353. Orders for troop movements must be issued sufficiently in advance to permit preparation by the troops. For items to be included in a march order, see FM 101–5.

354. The routes should be reconnoitered and marked prior to the commencement of the march. Timely measures are taken for preparation of stream crossings and for the removal of obstacles and other possible causes of delay.

Careful examination is made of fords, bridges, and ice before attempting a stream crossing.

355. *Cross-country marches* usually will be necessary in the development and approach march preliminary to battle, or in the extension of a command for the purpose of diminishing its vulnerability to air attack. Overextension in depth is avoided by increasing the number of columns on the front of advance.

In difficult terrain, foot and mounted troops constitute the elements of a command most capable of cross-country movement.

356. With the approach of a column to close contact with strong hostile forces, it becomes necessary to abandon the road and to develop the route column into a broader formation. The development of a large command is expedited by an advance in several columns. The area where development starts ordinarily depends upon the effectiveness of the enemy's artillery fire. As a rule, time can be saved and losses avoided by detouring isolated areas under hostile observation or fire rather than by starting early development.

357. The development of the column is effected by breaking the single column into several roughly parallel columns, each of which is assigned a march objective. As contact with the enemy becomes imminent, these columns themselves are developed into smaller columns.

Time is generally gained in the execution of the development by assigning the longest routes to the leading units of the column.

358. The result of the complete development of the command is to distribute the troops in accordance with the commander's plan of action.

The development of a division usually terminates in the occupation of assembly positions by front line units preliminary to deployment for attack or defense.

359. Assembly positions are so selected as to be, as far as practicable, screened from air and ground observation and reconnaissance. Terrain which provides turn-arounds for motor vehicles, natural protection against a mechanized attack and accessible ground observation is desirable. The position should be such that the troops have at their disposal favorable lines of advance to their combat positions. When the terrain does not afford concealment, the assembly position of a division in daylight is usually beyond the effective range of hostile artillery. The assembly position is protected by antitank weapons and local security detachments. The artillery is so disposed that it can protect the occupation of the assembly position.

360. Massing of units in close formation in assembly positions is avoided. Units are separated by sufficient intervals and distances to insure that concentrated targets are not offered to hostile air attack or artillery fire. Each unit makes its own provisions for local all-around security.

361. When a command executes its development under cover of darkness, all preparations for the maneuver are completed, as far as practicable, before dark. A covering force is sent forward without delay to gain contact with the enemy; routes of advance are reconnoitered and marked; if necessary artillery protects the occupation of the assembly position by occupying suitable firing positions before dark or completing its preparations for night firing. In general, the provisions for night marches apply.

362. *Night marches* often are required to provide concealment from air and ground observation, and security from air attack. They may be made for the purpose of avoiding excessive heat.

When troops are being concentrated by night marches, movement before dark except by small detachments and single vehicles should be prohibited, and daybreak should find the troops either in position or in concealed localities.

363. Night marches must be prepared carefully. Prior reconnaissance of routes and assembly areas is important. Special precautions are taken to insure the maintenance of direction and connection within the column. Guides and connecting groups are furnished whenever practicable.

364. When concealment is sought during night marches, measures to avoid disclosure must be rigidly enforced. Such measures may include enforcement of light discipline; instructions to halt or to clear the road when illuminated by flares; rapid bounds by motor and mounted elements between successive areas of concealment; silencing all radios: and when near the enemy, the maintenance of silence by personnel, and so far as practicable the suppression of noises made by vehicles, motors, and equipment.

365. *Forced marches* impair the fighting power of troops and are undertaken in cases of necessity only. The completion of the march must find the troops in condition to accomplish the object of the movement. Requirements for increased rates of march are met, wherever practicable, by the use of motor transportation.

The length of marches of foot and mounted troops is increased by increasing the number of marching hours per day, rather than by increasing the hourly rate of march. The march may be broken into short stretches by halts of several hours' duration. A long forced march practically becomes a succession of daily marches of greater average length with shorter intervals of rest.

366. For march details, see FM 101–10.

MARCH TECHNIQUE

367. In each arm and service, movement is based upon a *march unit.* In foot and mounted units, the battalion or squadron constitutes the march unit. In motorized and mechanized units, the march unit will be composed ordinarily of a number of vehicles easily controlled by one commander; the company, troop, or battery, or exceptionally the battalion, is the most satisfactory march unit. Small separate units may be constituted as march units or attached to march units.

In each march unit, the order of march of the several component units is normally changed daily. Rotation in the order of the march of larger units also may be ordered when permitted by the situation.

368. Distance between march units, and between elements within march units, is prescribed for each march in accordance with the situation.

Irregularities in the rate of march in columns are absorbed, as far as practicable, within the space between march units. In motor columns, irregularities are also absorbed between vehicles.

369. A march column is formed by the successive arrival of its component units at an initial point located in the direction of march. It should be inconspicuous to hostile air observation and easy to identify on the ground.

370. Initial points, and the time at which the heads of columns pass and the tails of columns clear the initial points, are stated in the march order or in a march table accompanying it.

When a large unit marches in several columns, the march order may fix an initial point for each column, or designate an initial line to be reached or cleared at a prescribed hour by a specified element of each column. When an initial line is designated, each column commander fixes an initial point and time of passage in such manner as to pass the initial line as prescribed in the orders of the higher commander.

371. Commanders of subordinate units of a column consider the route to be followed in reaching the initial point, calculate the time required, and start their commands so that there will be neither delay nor waiting at the initial point or elsewhere.

372. When several elements of a command marching by different routes are to join on a single road or when their routes of march cross each other, arrival at or clearing of the point of junction is so timed as to prevent interference between columns.

When an unforeseen crossing of two columns occurs and no control personnel of a superior headquarters is present, the senior commander regulates the crossing, basing his action on the situation and the missions of the two columns.

373. The time to be fixed for the start of the march depends upon the situation, the length of the march, and the time at which the troops must arrive at their destination.

374. The *rates and lengths of march* vary with the situation, weather, time of day, character of the roads, condition of the troops, nature of the terrain, and the obstacles that must be overcome. Average rates and lengths of march are given in FM 101–10.

The elongation of a column varies with speed of movement, road conditions, weather, condition of the troops, and the march disposition adopted for antiaircraft protection.

In each march unit, the leading element under the direction of its commanding officer regulates the rate of march in accordance with instructions issued for the march.

375. *Motor columns* may move in open or close column formation at prescribed rates or by infiltration at high speed. (See FM 25–10.)

376. Ordinarily, troops keep to the right of the road, leaving the left free for passage of other traffic along the column. On muddy, sandy, or dusty roads, or when both sides of the road provide concealment from air observation, or when attack by hostile combat aviation is probable, troops may be directed to march on both sides of the road, the middle of the road being kept clear for other traffic.

377. *Rest periods during a march* are a necessity and are habitually taken at regular intervals to rest men and animals, to service vehicles, to adjust equipment, and for other purposes. Halts generally are regulated by standing operating procedure. Unit commanders are promptly notified of the time and approximate length of any halts not provided for in the march order.

378. After the first halt, which usually lasts 15 minutes, columns containing foot elements halt 10 minutes each hour; mounted troops halt from 5 to 10 minutes each hour. The halts of motor columns are made every 2 or 3 hours.

All march units of foot troops halt simultaneously and resume marching simultaneously; all march units of mounted, motorized, or armored troops may halt and resume marching simultaneously or successively.

At the signal for the halt, units bear to the side of the road and troops fall out or dismount to rest. The road must be left clear by units at a halt.

Shortly before the termination of the halt, the commander of each march unit gives the preparatory signal for the resumption of the march. Foot troops fall in, mounted men remount, drivers resume their seats. Each unit moves out at the signal of its unit commander.

379. It is desirable to finish the day's march early. However, the length of the march or the desirability of avoiding excessive midday heat may render it advantageous to make a long halt toward the middle of the day.

At long halts, each unit or group moves to a previously reconnoitered location in proximity to the route of march. Mounted units are located near sources of water supply.

380. Men are not permitted to fall out during the march or to leave the immediate vicinity of their unit during halts, without the specific authority of an officer of their unit. An officer marches at the tail of each march unit. He is charged with keeping the unit closed up and with preventing straggling. He examines men who fall out on account of sickness or sore feet. He gives them a written note to the surgeon or requires them to continue the march.

A small guard marches at the tail of each regiment and separate unit to control stragglers not admitted to the medical vehicle by the surgeon.

A detachment of military police marches in rear of the combat troops of each column. It arrests men found absent from their units without authority and, except in cases of men apprehended for serious offenses, turns them over to their units at the first opportunity with a statement of the circumstances of their apprehension. For organization and duties of military police, see FM 19–5.

381. One of the medical officers attached to a troop unit marches at the tail of the unit. He examines men authorized to wait his passage. He admits them to the medical vehicle or authorizes them to place arms and equipment (in whole or in part) on that vehicle or other transportation provided for the purpose, or directs them to report to the guard at the tail of the regiment. One or more medical vehicles march at the tail of each regiment and similar unit for the transportation of men who become sick or disabled.

For details concerning collection and evacuation of casualties, see FM 100–10.

382. A vehicle which is compelled to halt moves off to one side of the road and signals vehicles in rear to pass. Disabled vehicles are promptly removed from the road.

383. Assemblies from march columns occur incident to long halts, occupation of assembly positions during development for combat, entrucking and detrucking, and for other purposes. The column commander selects the assembly area in accordance with the situation or instructions received. He allots portions of the area to component elements according to the situation and probable future action. Whenever practicable, arrangements for the occupation of the area are based upon detailed reconnaissance.

384. Assembly areas may be announced in the initial march orders or during the course of the movement. In either case, subsequent arrangements are facilitated greatly by having representatives of the major units march near the head of the column. The column commander announces the location of his command post, and indicates to the representatives of the major units their respective areas in sufficient detail to prevent congestion and delay in clearing the roads. These representatives, after reconnoitering their respective areas and routes thereto, meet their units and conduct them to their assembly areas.

Provision is made for traffic control and security. (See ch. 7 and FM 25–10.)

Roads are promptly cleared. This is expedited, and wear and tear on motor vehicles are reduced by preparing turn-outs at places where motor columns leave the roads. For this purpose, engineers equipped with bulldozers are especially useful.

385. Special precautions are taken to avoid congestion and delay during the passage of obstacles and defiles. Provision is made promptly for antiaircraft protection. The massing of troops, especially in the vicinity of an obstacle or defile, is to be avoided.

386. *Fordable streams* are reconnoitered and provisions are made in advance for avoiding confusion and unnecessary delay at crossings to include the regaining of distances and the preparation of additional crossings.

When a road leads through swamps or quicksand or across a stream with treacherous bottom, the limits of the road are marked or warnings are placed at dangerous points.

387. An engineer officer in charge of any bridge is responsible for its structural adequacy and the regulation of traffic on the bridge and its approaches. Instructions issued by the engineer officer and the engineer bridge guard relative to the use of the bridge are strictly obeyed.

March commanders are responsible that vehicles exceeding the maximum load capacity of the bridge are cut out of the column for crossing at some other point.

388. Foot troops crossing bridges march without cadence. In crossing on a ponton bridge, mounted men lead their animals in column of twos; pairs of draft animals in front of the wheel pair are led; motor vehicles travel slowly, holding to the center of the bridge and maintaining the distance prescribed by the engineer officer.

389. In the event of a tactical emergency occuring at or near the bridge, troops on the bridge and its approaches are evacuated as directed by the engineer officer in charge.

390. In *ferrying operations,* foot troops are first brought to assembly areas, under cover, in the vicinity of the embarkation point. Here they are organized into tactical groupings corresponding to the capacity of the means for ferrying. Engineer equipment needed for the crossing but not already at the river, is issued to troops at the final assembly area where instructions for embarking and disembarking and for conduct during the crossing are given. At the proper time, each tactical grouping is conducted to the point of embarkation by an engineer guide. Movement from the final assembly area to the river is under the control of the engineer troops.

On arrival at the embarkation point, troops enter the boat or raft in the manner directed by the engineer in charge. The engineer in charge is responsible for the arrangement of the loads and for handling of the boats. Individual equipment is loosened so that it may be removed easily.

391. Vehicles may be ferried. While awaiting passage they are held under cover at a point where they will not block the approaches. Vehicles are loaded as directed by the engineer officer in charge. They usually are secured by brakes and blocking. Horses may be crossed by swimming. In unloading, the debarkation point is cleared promptly.

MOVEMENTS BY RAIL

392. The general organization, operation, and control of rail transportation are discussed in FM 100–10.

Check lists for orders, and entraining and detraining tables are contained in FM 101–5. Technical and logistical data pertaining to rail movements are contained in FM 101–10.

393. For distances less than 150 miles, it is generally expedient to move an infantry division by motor transportation (organic or attached); for distances between 150 and 350 miles, by forwarding vehicles over the highway while troops move by rail; and for distances beyond 350 miles, both troops and their vehicles by rail. Smaller units may be moved by rail over shorter distances.

394. Each unit will maintain a *record of current transportation requirements* for its movement as a whole and by separate units, including arrangement of trains and lists of supplies and equipage to accompany the troops under varying conditions. Units must be given timely notification of impending rail movements, in order to permit proper preparation.

395. Orders directing the movement of a unit by rail designate the points at which the entrainment of the unit will take place, indicate the number of trains and the hours of departure, and state the detraining area or destination of the movement, when these are definitely known and considerations of secrecy do not oppose. However, the movement is frequently directed to a regulating station from which the several units are routed to detraining stations.

396. The commander of the troops is responsible for the preparation of plans and tables regulating entrainment and departure of the elements of his command. He is assisted by a representative of the railway. The services of experienced commercial railroad employees should be utilized to the maximum in planning troop movements by rail.

397. The order in which elements are forwarded is determined by tactical and administrative factors.

398. The assignment of units to entraining points is determined by availability of suitable loading facilities, matériel to be loaded, and proximity of elements to entraining points.

399. A *transportation grouping* consists of the troops, equipment, and supplies transported on one train. When tactical considerations govern, tactical unity should be preserved and each element should be accompanied in the same train by its own vehicles and equipment.

400. A senior officer is detailed in charge of each entraining point. He supervises the entrainment, police, and antiaircraft security at the station and is furnished with the necessary guard, transportation, and other assistance.

401. Each unit moves to its entraining point in time to complete its entrainment before the scheduled hour of departure. Units should be directed to arrive at their designated entraining points at an hour amply sufficient to allow entraining but not so early as to result in congestion on routes to or at the entraining point. Premature entraining of personnel should be avoided.

402. The responsibility of the entraining officer ceases, and the responsibility of the commander of the transportation grouping (train commander) begins when entrainment is completed and the train has been accepted by the railway for movement. The train commander is responsible for the security, discipline. and administration en route but exercises no control over the operation of the train.

403. A representative of the command and an officer of the railway transportation service proceed to the detraining area in advance of the troops or arrive on the first train of the troop movement. The representative of the command determines the distribution of the troops in the detraining area, in accordance with the commander's instructions.

MOVEMENTS BY AIR

404. *Air transport* may be employed advantageously for moving troops and supplies at high speed.

405. Troops transported by air are formed into tactical groupings which correspond to the carrying capacity of the available transport. These groupings are constituted according to their tactical missions and are landed in accordance with the requirements of security and in the order of their probable participation in subsequent operations.

406. Essential items of equipment, and personnel and equipment necessary to the exercise of command are distributed among the available airplanes.

407. Security of the landing area is essential to a successful movement by air. Airborne troops may be used for this purpose. For operations by airborne troops, see chapter 14.

MOVEMENTS BY WATER

408. Water transport is characterized by large personnel and tonnage capacity, great range, and comparatively slow speed.

409. Waterborne movements are especially vulnerable to attack by hostile air, sea, and undersea forces. They must be accompanied by special means for protection. Transports normally travel in convoy under naval command and with a naval escort.

410. The ability of troops transported by water to land on any shore within a great range, facilitates surprise.

411. Troops to be transported by water are formed into tactical groupings corresponding to the carrying capacity of the available transports. These groupings are constituted according to their tactical missions, and are landed in accordance with the requirements of security and in the order of their probable participation in subsequent operations.

The distribution of troops, equipment, and supplies throughout the transports of a convoy is dependent upon the contemplated operations upon landing. For landing operations on hostile shores, it is essential that the combat loading insure that the organic and special equipment and supplies to be used are readily available on the same transport. Personnel and equipment necessary to the exercise of command are distributed among the available transports.

412. For operations by troops landing on hostile shores, see FM 31–5.

413. Instructions relative to security may be included in a march order or may be issued separately in fragmentary form.

414. The early information furnished by the reconnaissance elements becomes the first step in the security measures of the command.

Liaison and direct communication between reconnaissance elements and security detachments will be habitual.

Each column provides its own all-around security.

415. Troops will not fire on any aircraft unless it is clearly recognized as hostile, positively identified as hostile, or the aircraft attacks with bombs or gun fire. (See par. 271.)

416. *Active means of protection against air attack* include fighter aviation, antiaircraft artillery, and organic weapons.

417. *Antiaircraft protection* is employed at critical points along the route of march such as initial points, bridges or other defiles, detrucking areas, bivouac areas, and assembly areas.

If sufficient antiaircraft artillery is available, some may be distributed within the column to supplement organic weapons. Troops must be thoroughly trained in antiaircraft fire and indoctrinated in the effectiveness of their organic weapons against low flying aircraft.

418. *Antiairborne protection,* particularly at bridges or other defiles, should be provided. Highly mobile forces are particularly effective against airborne troops.

419. A *covering force* may be sent forward early to secure critical terrain well to the front.

420. Security along the axis of movement is provided by an advance guard whose mission is to prevent unnecessary delay of the main body, and to protect it against surprise and ground observation. The advance guard insures for the main body the time and space required for its deployment for action. When contact with important enemy forces is made, the action of the advance guard depends upon the plan for the employment of the main body. The advance guard commander is given early information of this plan.

421. The strength and composition of an advance guard vary with the strength and mobility of the command, its mission, the situation, the terrain, and the time of day. It should be no stronger than is necessary for security. Greater strength is required as the distance from the enemy decreases. For large commands, it comprises components of all arms. Engineers, when attached are kept well forward in advance guards.

422. *Reconnaissance aviation* may transmit urgent information directly to advance guard commanders.

423. Ample communication between elements of the advance guard and between the advance guard and the main body must be assured.

424. The distance between the advance guard and the main body is sufficient to preserve for the commander his freedom of action in the employment of the main body, but is never so great as to expose the advance guard to defeat before assistance can reach it. Distances are reduced at night, in close terrain, under conditions of low visibility and restricted observation, or when the advance guard is small.

425. The advance guard accomplishes its mission by reconnoitering the terrain to the front and on each side of the line of march, overcoming isolated hostile resistance, reconnoitering and preparing so far as practicable the route of advance for the movement of the troops (removal of obstacles and mine fields, repair of bridges and roads). It reconnoiters those points which afford extended observation of the dispositions of the main body, or which provide concealment for hostile reconnoitering or harassing detachments. It seizes and holds important features of the terrain, particularly those that will cover from hostile observation the deployment of the main body and provide good observation and defilade for the employment of the artillery. According to circumstances, it pushes back hostile covering detachments, or opposes an enemy advance in force long enough to permit the main body to make its dispositions.

426. The *formation of an advance guard* is such as to assure its own security and provide sufficient distribution in depth and width for its maneuver. From front to rear, it is divided into highly mobile reconnaissance detachments, the point, the advance party, the support, and the reserve. In small advance guards, the reserve may be omitted.

427. The considerations governing the advance guard of a combined force of all arms apply also to the security of the more mobile forces, cavalry, armored, and completely motorized units. The principal modifications result from the superior mobility of these units. Advance guards operate at greater distances from the main body and with greater distances between their own elements. The zone of reconnaissance is more extensive, both to the front and flanks. Close cooperation of reconnaissance aviation is of special importance.

428. When hostile resistance is met, the leading elements of the advance guard deploy successively on a broader front. Prompt support of leading elements is necessary. Artillery occupies positions early and renders fire support. Precautions are taken against infiltration of hostile elements.

429. When the command makes a long halt during the course of a march, the advance or rear guard establishes a march outpost, usually from the support. Units of the support occupy critical terrain features controlling the approaches to the column, establish outguards at commanding points, and when necessary send out patrols. (See ch. 8.)

430. When the flanks of the command are not protected by adjacent units, it will frequently become necessary to provide protection by the detail of a flank guard, whose mission is to protect the marching column from ground observation and surprise from the flank, and in the event of an attack in force to provide the necessary time and space for the development of the main body.

When the main body executes a flank march in proximity to the enemy, flank protection assumes great importance; a strong flank guard is detailed. The advance guard may be converted into a flank guard to provide the protection required by a change in the direction of march. (For further details of composition and operation, see Field Manual of appropriate arm.)

431. In order to complete all-around security, a rear guard is detailed with the mission of protecting the rear of the main body from surprise, harrassing action, attack, and hostile ground observation. (For the strength, mission, and operations of a rear guard for a retiring force, see chapter 12. For composition and operation of rear guards, see Field Manual of appropriate arm.)

432. *Troop movements by air transport* require special security measures.

In flight, security is provided for such movements by flying in formation under escort of fighter aviation, by dispersing, or by flying at night or under other conditions of low visibility.

Loading and unloading points in areas under friendly control are protected by fighter aviation and ground forces, including antiaircraft artillery and antitank weapons.

Unloading points within the hostile lines are protected by fighter and bombardment aviation and by airborne troops dropped or landed in advance. Surprise, boldness, and detailed planning are the essence of such operations.

CHAPTER 10

THE OFFENSIVE

Section I. GENERAL

OBJECTIVE

433. An objective sometimes may be attained by maneuver alone; ordinarily it must be gained by battle. A sound tactical maneuver has a great influence on the successful outcome of battle.

434. The purpose of offensive action is the destruction of the hostile armed forces. To facilitate the accomplishment of this purpose, the commander selects a physical objective such as a body of troops, dominating terrain, a center of lines of communication, or other vital area in the hostile rear for his attack. The attainment of this objective is the basis of his own and all subordinate plans. This objective should have the following characteristics:

a. It's capture must be possible within the time and space limits imposed by the assigned mission.

b. Its capture should assure the destruction of the enemy in his position, or the threat of its capture should compel the enemy to evacuate his position.

c. It should produce a convergence of effort.

d. It must be easily identified.

e. Its capture should facilitate contemplated future operations.

435. The objective having been selected, all components are directed in coordinated efforts towards its attainment. Actions which do not contribute to this purpose are avoided.

436. Sound tactical maneuver in the offensive is characterized by a concentration of effort in a direction where success will insure the attainment of the objective. On the remainder of the front are used only the minimum means necessary to deceive the enemy and to hinder his maneuver to oppose the main attack.

DISTRIBUTION OF FORCES

437. In the offensive, troops are distributed into two or more principal tactical groupings: one or more main or decisive attacks in which the greatest possible offensive power is concentrated to bring about a decision, and one or more secondary or holding attacks whose mission is to render maximum assistance to the main attack.

Main attack groupings are designed to secure the objective and to destroy the hostile force. Secondary attack groupings are designed to hold the enemy in position, to force him to commit his reserves prematurely and to an indecisive location. and to prevent him from reinforcing the front of the main attack.

438. In each tactical grouping, the mass of the available means of combat is applied in a decisive direction.

439. *Main attacks* are characterized by narrow zones of action, strong support of artillery, tanks, and other supporting weapons, effective support of combat aviation, and deep echelonment of reserves.

440. *Secondary attacks* are characterized by lack of depth, reduction of reserves to the minimum, maximum fire power in the attacking echelon, and wide zones of action for the attack units. They will therefore usually be assigned limited objectives initially.

441. When it is impracticable to determine initially when or where the main attack is to be made, the com mander retains his freedom to act by disposing his forces in great depth, by holding out strong reserves, and by maintaining close control of his supporting weapons. Mobility of general reserves permits the shifting of the location of the main attack to exploit the success of a secondary attack.

442. Attacking echelons once committed to action lose their immediate availability for employment in the execution of other missions. Deployed and under fire, they can change front only at the risk of incurring heavy losses. The commander can materially influence the course of an action once begun through the employment of reserves, fire support, and by coordination with the air forces commander.

443. In *selecting the direction for the main attack,* the terrain must be carefully studied. The choice of the front on which the main attack and the main efforts of subordinate units are made often is determined by the possibilities which the terrain offers for effective employment of artillery and mechanized units.

Selection of the direction of the main attack is influenced also by the time available for movement before the attack must be launched. In situations where speed is essential, mobile units composed largely of armor may be employed. Such units should not be employed against strongly prepared positions protected by obstacles.

Air superiority and effective coordination with combat aviation is an essential part of any major attack.

FORMS OF OFFENSIVE ACTION

444. Attack maneuvers are classified as *envelopments* and *penetrations.*

445. In an envelopment, the main attack is directed against the flank or rear of the initial disposition of the enemys' main forces and toward an objective in rear of his front lines. It seeks to surround that portion of the enemys' forces in front of the objective. It is assisted usually by a secondary attack directed against the enemys' front.

A successful envelopment depends largely on the degree of surprise attained and on the ability of the secondary attack to contain the bulk of the enemy's forces. Surprise is secured by maneuvering to avoid observation by the enemy and by deceiving him. Superior mobility increases the prospect of success.

An envelopment avoids attacking on ground chosen by the enemy, and forces him to fight in two or more directions to meet the converging efforts of the attack. Every effort is made to strike the defenders' flank or rear in order to avoid any part of his organized front. Such an attack minimizes losses, handicaps the defender's ability to meet it promptly, compels the defender to fight on ground chosen by the attacker, and produces decisive results.

446. A *turning movement* is an enveloping maneuver which passes around the enemy's main forces to strike at some vital point deep in the hostile rear. The force making the maneuver usually operates so far from the secondary attack that the principal tactical groupings are beyond mutual supporting distance (the distance by which forces may be separated and yet permit one to move to the aid of another before it can be defeated by an enemy force); hence, each grouping must be strong enough or mobile enough to avoid defeat in detail. When conditions favor such action, all combat elements of the command may be employed in the turning force, leaving only reconnaissance elements confronting the hostile dispositions. The turning movement is adapted particularly to highly mobile commands, such as cavalry, armored and motorized forces, and forces transported by aircraft. It is invariably employed by highly mobile forces in situations in which the vital objective in the hostile rear can be seized by such a maneuver before it is necessary to involve the enveloping force in a major engagement with the enemy. Deception, secrecy, and mobility are vital to successful execution of a turning movement.

447. When the enemy takes up a defensive position, the commander of the attacking forces should consider the possibility of turning the enemy out of his position and forcing him to withdraw and fight on ground more favorable to the attacker.

Situations may occur, especially in the pursuit of a defeated force, in which the enemy can be forced by direct attack to take up a defensive position while a portion of the more mobile attacking forces executes a turning movement against his lines of communication.

448. A *double envelopment* is executed by three principal tactical groups, two enveloping attack forces and a secondary attack force. A simultaneous envelopment of both flanks generally requires considerable superiority.

The command seeking to attack by double development must be deployed or capable of deploying on a broad front against an enemy on a much narrower front or with little capability or room for maneuver. The maneuver is executed by fighting a holding battle with the center while enveloping forces strike on both hostile flanks. When mobile forces are available in reserve, they may complete the envelopment by an attack from the rear. When conditions favor it, this form of maneuver should be used because of the decisive results it promises. After an initial envelopment of one flank, favorable conditions for passing to a double envelopment through the use of reserves may be created when the success of our troops has placed the enemy in a disadvantageous situation.

449. The enemy's preparations to meet an envelopment of his flank ordinarily cannot be organized as completely as the defense of his front without sacrificing the strength of his original front, especially if the envelopment is launched from a locality deep on the hostile flank or rear.

The defender strengthens an unsupported flank by reserves echeloned in depth and in width. When threatened with envelopment he moves them to meet the maneuver, if necessary reconstituting reserves from those portions of his front not heavily attacked. He may attempt to envelop the attacking forces, or to extend his flank beyond that of the attack up to the limit of his strength. An attempt on the part of the attacker to meet such hostile extension may lead to overextension or to a dangerous separation of the enveloping forces from those making the secondary attack. It usually is better to take advantage of the enemy's extension and consequent weakness by retaining a deep formation and to penetrate his thinly held front than to overextend in an effort further to outflank the position. When the enemy extends his position beyond the enveloping forces, particular attention must be paid to protecting the exterior flank by the use of the general reserves of the higher commander.

450. When the situation does not favor an envelopment, the main attack is directed to penetrate the hostile front. *Conditions which demand a penetration* are enemy's flanks unassailable or lack of time to make an enveloping maneuver. *Conditions which favor a penetration* are overextension of the enemy or terrain and observation favorable for more effective cooperation of the combined arms. Such an attack often can be organized more quickly than can an envelopment.

451. In a *penetration* the main attack passes through some portion of the area occupied by the enemy's main forces and is directed on an objective in his rear.

It is characterized by the complete rupture of the enemy's dispositions; the seizure of the objective by operations through the gap: and the envelopment of one or both flanks created by the break-through.

The essential conditions for success are surprise. sufficient fire power, especially artillery. to neutralize the area of penetration, favorable terrain within the hostile position for the advance of the attacking troops, and strength to carry the attack through to its objective.

452. In the penetration of a defensive position, the main attack is launched on a front wider than that of the contemplated break-through in order to hold the enemy in place on the flanks of the penetration. The attack on the remainder of the hostile front is designed to contain the enemy and prevent him from moving his reserves.

The amount of artillery, mechanized units, and combat aviation available largely determines the width of the front of penetration. The wider the front of penetration, the deeper it can be driven and the more difficult it will be for the enemy to close the gap. The deeper the penetration, the more effective will be the action of mobile reserves in seizing the objective and rolling up the hostile flanks.

The greatest distribution in depth is placed opposite the prospective front of penetration. The distribution of troops provides for *three separate impulses:* a break through the hostile position, a widening of the gap thus created by enveloping one or both interior hostile flanks, and the seizure of the objective and exploitation of the success.

The sequence of these impulses depends on the situation. In some situations it is practicable through the existence of weaknesses or gaps in the enemy's front for mobile troops (armored, motorized, or cavalry divisions) to break through and to proceed straight to the objective, while operations of local envelopment and exploitation are performed by less mobile troops. In other situations foot troops must break through, the more mobile troops being held initially in reserve and used later to operate through the gap created by the foot troops.

453. The mission of the attacking echelon of troops is to break through the enemy's dispositions to a depth which will prevent the maintenance of the continuity of his battle position. Until this mission has been accomplished, the attacking troops do not divert their strength to the attack of the flanks of the gap. Hostile counterattacks against the flanks of the penetration are met by reserves, by the fire of the artillery, and by combat aviation.

The missions of rolling up the flanks of a gap created by penetration and of exploiting the breakthrough are assigned to reserves. Cavalry, armored, and motorized units are especially suitable for seizing the objective and for exploitation. Combat aviation is employed against hostile reserves and other important objectives to prevent reinforcement of the area under attack. Troops transported by air may be used to support these operations.

454. In large commands, a penetration often is initiated by launching simultaneously two or more powerful attacks (a multiple penetration) against weak localities on the hostile front. Strong localities are contained initially by secondary attacks. When the penetrating attacks have advanced sufficiently far, the interior strong localities are reduced by maneuver, and the penetrating attacks are united into a single main attack. The pinching out of strong hostile localities often is facilitated by launching multiple penetrations in converging directions. The doctrines applicable to a single penetration govern the organization and conduct of a multiple penetration.

455. Whether the maneuver adopted is an envelopment or a penetration, success will depend primarily on intelligent, energetic, and coordinated execution. This execution must be based on a sound plan which is influenced largely by the objective and direction of the main attack.

The doctrines which underlie the employment of the combined arms in the offensive are conservation of the combat power of troops in the attack echelon, provision of assistance for them to close with the enemy, and thereafter support of their attack until the enemy's power of resistance is broken.

FRONTAGES AND DEPTHS

456. The *frontage* assigned to any unit in an attack varies with the mobility, type of armament, mission, and combat power of the unit, the terrain, the amount of fire support available, and the probable hostile resistance. As a general guide, an infantry battalion at full strength in a main attack seldom is assigned a frontage less than 500 yards or more than 1,000 yards measured on the front of the hostile position. In the development or in a secondary attack, frontages up to 2,000 yards may be assigned.

457. Units are distributed in *depth* to provide flexibility of maneuver, continuity in the attack, and security. For infantry units, depth of formation for combat rather than a wide extension of front is necessary in the initial deployment since the progress of battle will call for maneuvers that cannot be clearly foreseen. This condition can be met only by initial distribution in depth.

Laterally the distribution of troops in attack is governed principally by the scheme of maneuver. It is influenced also by the relative advantages offered by different sections of the terrain. When the situation requires an unusually wide extension of the command, the increase is effected by widening the gaps between units.

RESERVES

458. The initial strength and location of the *reserve* will vary with its contemplated missions, the type of maneuver, possible hostile reaction, and clarity of the situation. After the attack is launched the reserve and the fires of supporting arms are the principal means available to the commander for shaping the course of action and for enforcing a favorable decision.

The primary mission of the reserve is to enter the action offensively at the proper place and moment to clinch the victory. Hence its initial strength and location are controlled largely by the maneuver to be executed.

459. In a penetration the reserve must be large enough to exploit the break-through by enveloping one or both of the flanks created and by operating deep in the hostile rear.

460. In an envelopment the reserve must be large enough to extend the envelopment or to exploit a successful enveloping action by operating against the hostile rear. To favor the envelopment the reserve is disposed toward the flank enveloped.

461. When open flanks exist or when there is danger of a hostile threat, some reserves are disposed to meet dangerous contingencies. This situation will frequently be met by echelonment of these reserves to provide depth in at least two threatened directions.

462. When the situation is relatively clear and enemy capabilities are limited, the reserve may consist of a small fraction of the command disposed to favor the maneuver. When the situation is obscure, the reserve may consist initially of the bulk of the command, centrally located and prepared to move to any point on the front or flanks.

463. The location of the reserve should combine a maximum of protection for itself against hostile observation and air and mechanized attack with a road net which facilitates rapid movement to any point of possible employment. Motor vehicles should be held available for the movement of reserves lacking organic means of rapid movement.

464. Choosing the proper time at which the reserve should be used is often the commander's most difficult and most important decision.

Nevertheless, at the decisive moment of action every man that can be used to advantage must participate in the battle and the reserve must be launched without hesitation. As far as practicable the reserve is sent by complete units. Reinforcement by driblets is avoided. Commanders endeavor to reconstitute reserves from troops which the course of the action has made available.

COORDINATION

465. The commander is responsible for coordination of the action of all elements of his command.

466. In all cases the highest degree of coordination permitted by the situation and time element is sought. The considerations discussed below are applicable in general to situations in which thorough coordination can be prescribed. In other situations they are applied to the degree practicable.

467. Against a strong enemy, a decision to develop and deploy for attack directly from march columns risks loss of control and sacrifices some of the capabilities of artillery, tanks, and other supporting weapons. An attack in a moving situation may be best organized and coordinated in assembly positions.

468. From a march formation the commander develops the main body for a coordinated attack by assigning march objectives to the larger units, usually the assembly positions they are to occupy, and routes or zones of advance thereto. The development order announces the missions of units already engaged, the missions of the artillery, the dispositions of the main body, the security measures to be taken, and instructions for further reconnaissance. It provides for essential administrative details so that the necessary preparations can be made. Instructions given in the development order are as complete as possible so that the attack order may be brief. For movement to assembly positions and security during development, see paragraphs 356–361, and 428.

469. The location of assembly positions is dependent on several factors. Darkness, cover from observed hostile artillery fire, a thorough knowledge of the situation, and a plan of attack already decided favor advanced positions located in conformity with the plan of maneuver. Conditions the reverse of these require the selection of assembly positions well back.

Units of high mobility such as tanks, cavalry, and armored forces may complete their development and preparations for battle at greater distances from the hostile front.

If the plan of attack involves an enveloping maneuver, the assembly position of the enveloping force is set off at a sufficient interval from the troops in the secondary attack to preclude interference between units when deployed for attack.

470. Subordinate commanders assigned assembly positions may in turn assign more advanced assembly positions to the component units of their commands as knowledge of the situation and of plans becomes available. The final assembly position of an infantry battalion in the attack echelon usually is in the most forward concealed position available in rear of the line of departure. It should afford cover from hostile small-arms fire.

471. While units are moving into and during the occupation of their assembly positions, the commander prepares his orders and completes arrangements for the execution of his plan of maneuver.

Commanders of troops in the attack echelon and the commanders of units designated to support them coordinate the action of their units. Wherever possible, reconnaissance and planning should be conducted concurrently with troop movement into such positions to insure against unnecessary delay.

472. As each unit arrives in its assembly position, measures are taken immediately for clearing the roads and for security against air, mechanized, or other attack. Signal communication is established without delay between the superior command post and the major subordinate units. Equipment not essential to combat is disposed of, extra ammunition is issued to troops, reconnaissances are completed, coordination of the plans of maneuver and plans of fire of subordinate units is completed, and attack orders are issued promptly.

473. Development of the command terminates with the troops distributed in accordance with the plan for their employment, and in an approach march formation favoring rapid deployment.

474. Should the commander decide that rapidity of action is essential to retain a tactical advantage, he may dispense with assembly positions, decentralize operations to combat teams or task forces, and issue orders to those units to develop and attack.

475. Subordinate units to be deployed for attack ordinarily are assigned a zone of action, a line of departure, and a direction of attack or an objective. Zones of action regulate the limits for battle reconnaissance and combat of the unit. It is not necessary that troop formations extend across the entire zone of action of a unit, as part of the zone of action can often be covered by fire, by small patrols, or by both. A preponderance of force on any particular part of the front is obtained by varying the width of the zones of action of subordinate units.

Zones of action are defined by designating their lateral boundaries or by the assignment of a front of deployment and the designation of the lateral limits of the objective. An open flank ordinarily is not bounded. In some situations, the designation of the objective is sufficient to indicate the zone of action. In large units the designation of objectives and boundaries may be made from the map; in small units these designations are made on the ground. *Points designated should be easily identified on the ground.*

Zones of action should extend through the depth of the hostile position at least as far as the location of the hostile artillery and reserves, more deeply if the situation is definite. Important localities and terrain corridors commensurate with the size of a tactical unit should lie wholly within the zone of action of that unit. If it is desired that an adjacent unit render special assistance to another in the attack, this assistance should be clearly stated. During the progress of combat and especially when reserves are committed to action, appropriate changes in zones of action are made.

To take advantage of favorable routes of approach units may move temporarily into adjacent zones. Such movement must not interfere with the action of adjacent units or result in a dangerous massing of troops. The emplacement and movement of artillery and other supporting weapons in zones of action adjacent to the zone of the units they support are permissible, but must be carefully coordinated. (See par. 519.)

The battalion is ordinarily the smallest unit which is assigned a zone of action. Smaller units are usually assigned directions and objectives.

When lateral boundaries are not clearly defined they are supplemented by assigning compass directions of attack. This is particularly important in small units.

When tactical groupings are separated initially by wide intervals and the direction of their subsequent maneuvers cannot be foreseen, designation of a boundary between them may be withheld until a later phase of the action. In such situations it frequently will be necessary to establish a limiting line between them for coordination and control of their supporting fires.

476. A *line of departure* usually is designated from which the attacking troops are launched at the prescribed hour or separate lines of departure, and hours are assigned to the several attacking units. The purpose of the line of departure is to coordinate the advance of the attack echelon so that its elements will strike the enemy in the order and at the time desired. This line should be recognized easily on the ground and should be approximately perpendicular to the direction of attack.

477. The *time of attack* is the hour at which the attack is to be launched. If a line of departure is prescribed, it is the hour at which the line is to be crossed by the leading elements of the attack. It is determined by the time required for commanders to make the necessary reconnaissance, prepare plans, and issue orders; for the cooperating arms to coordinate their plans; and for the attack echelon to organize its attack and move to position.

The secondary attack may be launched prior to the main attack to force the enemy to commit the greatest possible portion of his forces against that attack, or the main and secondary attacks may be launched simultaneously.

Unity of effort is promoted by assigning subordinate units objectives which insure mutual support and by prescribing where and in what direction subordinate units are to make their main effort. The combat action and direction of attack taken by subordinate commanders must be such as to build up the main effort in accordance with the scheme of maneuver of the superior commander.

The commander must endeavor constantly to prevent the attack from breaking up into a series of uncoordinated combats.

478. The *degree of surprise* attained is dependent in a large measure on the coordination and timing of the measures taken to deceive the enemy. Ruses, demonstrations, feints, and other measures for deception executed at the wrong time and place will be obvious to an alert enemy and will warn him of the impending attack. Superior mobility and speed of execution may be determining factors in achieving surprise.

479. The best guarantee for success in the attack is effective cooperation between the troops in the attack echelon, the supporting artillery, and combat aviation. The superior commander coordinates the fire support of his artillery with the plan of maneuver of the attacking troops.

The ground and air commanders must plan the attack jointly. The efforts of ground and air units must be coordinated closely to insure success of the theater commander's scheme of maneuver.

480. To assure close cooperaton with the attacking troops. *artillery units* assigned to direct support of designated units maintain constant connection with supported units through common command posts or by liaison agents. Ordinarily an artillery battalion is placed in direct support of an infantry regiment or a cavalry brigade. Cooperation is facilitated by habitually associating the same units on the march and in combat.

481. The command post of the division artillery is at or in the proximity of the division command post. The same rule applies in the case of the senior artillery commander of a smaller force of combined arms.

Initially both the command post of the artillery and of the supported unit are located together. Locating command posts together is a responsibilty of both commanders. If separation of command posts becomes necessary during the course of action, the artillery commander establishes liaison and maintains signal communication with the commander of the supported unit.

482. The commander of the supported unit informs the supporting artillery commander of the situation, his plan of attack, and the artillery support desired. The supporting artillery commander informs the supported commander of the terrain features essential for artillery observation and those that must be seized during the advance to obtain essential observation, the terrain which the artillery commands with observation and fire, and the means by which the artillery can most effectively support the attack. (See par. 509.)

Based on this exchange of information, the associated commanders arrange the plan of fire support to be given by the artillery during the attack.

The artillery commander must comply with the requests of the supported unit commander to the limit of his capabilities, subject only to orders received from higher authority. If he receives a fire mission which conflicts with the needs of the supported troops, he reports the situation to the commander ordering the mission and then complies with the resulting decision. If the urgency of the situation precludes this report, the artillery commander acts on his own initiative in accordance with his knowledge of the situation, reporting his action to his superior at the first opportunity.

A liaison section is assigned to each supported infantry battalion or cavalry regiment. A mutual obligation rests upon the commanders of supported and supporting units that liaison once established is maintained. It is essential that the supporting artillery know at all times the location of the leading elements of the attack echelon and be kept informed of the plans of the supported unit.

483. The fire of other supporting weapons is coordinated with that of the artillery. The fire of these weapons supplements the artillery fire of direct support chiefly by engaging targets in the immediate foreground whose neutralization by artillery might endanger the attack echelon, and targets within range on which artillery fire cannot be placed.

484. Early and adequate joint planning is necessary in order to obtain close coordination of the ground force elements and combat aviation which are employed in the attack. The first objective of this combat aviation is those hostile elements, the destruction or neutralization of which will contribute most toward a successful attack. During battle, combat aviation is especially useful as a means, immediately available through the air force commander, to exploit a success, to correct an adverse ground situation, to attack hostile reserves or reinforcements, or to aid friendly ground troops in overcoming unexpected resistance.

485. For cooperation between the air and ground command concerning air operations on or about the battle area, see FM 31–35 and 100–20.

486. An integration of the attack into a unified whole requires complete coordination and cooperation, prior to and during the operation, between supporting tanks, artillery, and combat aviation. (See chs. 2 and 16.)

487. Because of the difficulty of establishing and maintaining effective chemical concentrations in mobile operations, use by the attacker of chemical agents other than smoke is limited. Smoke must be carefully employed in respect to both time and space and must be closely coordinated with other supporting fires and with the action of tanks and supporting aviation. Under favorable conditions of wind and weather, smoke is used to conceal the approach of the attack by blinding hostile observation posts, antitank guns, and infantry supporting weapons. It is especially useful during short periods when troops must cross exposed ground.

488. As soon as the commander has made his decision, he completes his plan of attack and issues his *attack order,* wherein he prescribes the necessary coordination for the action. (See FM 101–5.)

489. When conditions limit the ability of the commander to exercise a timely and direct influence on the action, the initiative of subordinates must be relied upon to a great extent. The commander issues less detailed orders to those tactical groupings over whose action he can not exercise a direct influence, and attaches to them the means necessary to accomplish their tasks. He remains with and personally directs the action of the troops whose mission is of decisive importance to the action. This method of conducting an operation is most prevalent in pursuits, in opening phases of a meeting engagement, during crises of battle, and in envelopments in which the main and secondary attacks are separated by wide intervals. The greatest degree of coordination possible is prescribed initially; complete coordination is accomplished as soon as the course of action permits. (See par. 128.)

490. Coordination is assured by command and staff visits to subordinates to see that orders are understood and are being carried out.

Section II. ATTACK IN WAR OF MOVEMENT

491. A *meeting engagement* is a collision between two opposing forces en route. A tactical situation which develops on first contact may have a strong influence on the course of the subsequent action. A great advantage, therefore, accrues to the force which first completes effective preparations for combat. Action cannot be delayed awaiting the result of detailed reconnaissances. Prompt estimate of the situation, quick decision, and prompt action are essential for success.

492. As soon as the prospect of contact becomes apparent, the superior commander initiates plans for the operation and disposes his command to facilitate rapid entry into action. (See par. 1040 for missions of armored units.) Information gained by the reconnaissance agencies during the advance affords a basis for the commander's preliminary disposition, and may enable him to determine the general line of engagement and the plan of attack.

As a rule, however, the enemy's intentions will remain obscure and seldom will be clarified until after the initial engagement. When timely information is lacking, subordinate commanders are relied upon to exercise their initiative and make important decisions in accordance with the general mission and known intentions of the superior commander. Without delay, the latter coordinates the action which his subordinates have begun. To insure prompt and correct decisions, adequate and quick coordination, and proper employment of units, commanders of all echelons must be well forward when the enemy is engaged.

493. Early and rapid transmission of orders is essential to an orderly and timely employment of the command and may be vital, particularly for columns of high mobility. Initial orders are ordinarily issued in fragmentary form, their sequence of issue being based upon the priority of, and time required for, execution. To facilitate prompt communication, one (or more) advance message center or command post is established.

494. Employment of the *advance guard* is the commander's first problem and is the basis for the subsequent employment of the remainder of his force. When contact is imminent or when the zone of effective artillery fire is entered, the advance guard moves forward on a broad front. Upon encountering resistance the advance guard must seize terrain affording good observation for the artillery and other supporting weapons. Its principal function is to gain time and space for the development and use of the main body.

These missions require aggressive action against the enemy's leading troops. However, unfavorable terrain or superior hostile forces may necessitate or make advisable a temporary defense or even a limited retirement to preserve freedom of action. Whatever the situation, all advance guard actions are characterized by speed and aggressiveness, by broad fronts, and by small or no reserves.

495. The advance guard performs its mission most effectively when, after possessing itself of essential terrain features, it is disposed to protect the development of the main body. Artillery deploys on a broad front, opens long range fire on enemy columns to force their early deployment, and interdicts the principal routes of approach.

The advance guard is strongly reinforced by artillery from the main body. It is reinforced by other elements of the main body only when the situation clearly demands it.

496. *Cavalry* after withdrawing from the front of advance-guard infantry may be employed on the flanks to screen our own dispositions, to execute further reconnaissance or harassing action against the hostile flanks and rear, or may be held in reserve.

497. The speed of modern offensive operations demands that supporting artillery be prepared to react immediately with fire when opportune targets are presented. To do this, observation and gun positions must be as far forward as possible.

Early entry into action of the bulk of the artillery is essential to protect the development, to give support and cohesion to the advance-guard action, and to gain an early superiority over the hostile batteries.

It may be necessary for a portion of the artillery to occupy temporary firing positions to insure that troops do not come under fire without artillery protection.

498. The artillery preferably is deployed initially to protect the development and support the attack from the same position areas. When initial positions are too distant, the artillery in direct support must displace forward to assure close support of the attack echelon.

499. In accordance with his estimate of the situation, the commander develops the main body and organizes a coordinated attack; strikes directly from march columns with part of his command while organizing a more coordinated blow with the remainder; or attacks with his whole force from march columns as units become available, the latter an uncoordinated piecemeal commitment. (See pars. 467–469 and 489.)

500. While the main body is developing for its attack, units in contact with the enemy execute a concurrent phase of the maneuver, the *development of the enemy position*. Their mission is to determine the strength and dispositions of the enemy, the location of his flanks, artillery, and local reserves, in order to provide a picture of the enemy's situation upon which the commander can base a workable attack plan. This mission should be accomplished early to avoid loss of time in launching an attack because of faulty or inadequate intelligence.

The commander of each attack unit directs its advance in the assigned zone of action to cross the line of departure at the prescribed hour. Each attack unit reconnoiters its zone of action and supports the reconnaissance elements with its supporting weapons. To keep troops in hand prior to contact, a base unit is usually designated on which other units regulate their advance from one terrain line to the next. Terrain features which afford extended observation, or which are otherwise of tactical importance, are the objectives of each bound.

501. Regardless of whether the attack is launched from assembly positions or directly from march columns, the method of approach to the hostile position is the same. Each battalion of the attack echelon moves to the most advanced position in which it can make its final preparations under cover from small-arms fire.

502. Whether an offensive battle is the result of a meeting engagement or is based on the attack of an organized position, the *conduct of the attack* from the time the enemy is engaged until he is defeated is essentially the same. What difference there is exists in the coordination, power, and speed developed in the opening phases. (See pars. 516–553.)

Section III. ATTACK OF AN ORGANIZED POSITION

PRELIMINARY OPERATIONS

503. Ordinarily the defender will attempt to screen his main position and deceive the attacker regarding his dispositions by the employment of covering forces. A thorough reconnaissance of the hostile position and its foreground is of primary importance. This reconnaissance seeks to determine the location, depth, and extension of the hostile position, the hostile occupation of the position, contaminated areas, the location of the hostile artillery, and natural and artificial tank obstacles. It involves a thorough study of the map and air photographs of the enemy's combat zone, and the use of available air and ground reconnaissance agencies.

504. If reconnaissance and advance detachments fail to establish definitely the hostile main position, the leading troops are reinforced strongly by artillery and other supporting troops. The reinforced leading troops execute a *reconnaissance in force* against critical points in the enemy's outpost zone to drive in the enemy's covering forces and determine the hostile main position. Their mission is to seize the terrain which will permit the proper deployment of the command and permit observation of the hostile battle position.

When the leading troops finally encounter a well-organized system of defensive fires of hostile artillery and other supporting weapons it may be taken as a reliable indication that the hostile battle position has been reached. The leading troops establish themselves on the critical points and cover the movement of the artillery to positions to support the attack.

505. During these preliminary operations, cavalry and other troops seek to locate the flanks of the hostile position. The leading elements are protected from hostile counterattack by strong supporting fires and by the presence of other units moved to concealed positions within supporting distance. The remainder of the command is held in readiness beyond the range of effective hostile artillery fire. Necessary measures are taken to protect it against air attack and attack by mechanized units.

506. Reconnaissance is continued to obtain information as a basis for the conduct of the attack. This reconnaissance provides more detailed information for the assignment of objectives and as a basis for the plan of fire of the artillery and the other supporting weapons.

Reconnaissance of the terrain must determine the most favorable routes of approach to the hostile position, the nature and strength of obstacles, location and extent of mine fields, and the possibilities for employment of mechanized units.

Air photographs of the hostile main position are distributed to subordinate commanders.

The terrain over which the attack must pass is studied on the ground and from air photographs to determine the areas which the defender has organized for defense and can cover with defensive fires, and the areas in which the attacker can advance best by flanking fire and maneuver.

Artillery conducts reconnaissance to determine the possibilities of artillery observation and fire, and the location of its firing positions and the routes of approach thereto.

507. *Determination of the weak points* in the enemy dispositions is of vital importance. By fire of artillery and other supporting weapons delivered from different directions, and by feints and raids, effort is made to ascertain the enemy's dispositions and his plan of defensive fires. Against an aggressive enemy a series of attacks may have to be launched before a weak spot is located.

PREPARATIONS FOR ATTACK

508. Based on the estimate of the situation, the main attack is made either as an envelopment or a penetration. A carefully coordinated attack is required. Orders are issued for the preparations for the attack and for the measures for secrecy and deception to be adopted.

Preparations for the attack include the completion of the signal communication system, organization of the command for combat, provision for ammunition supply, and the regulation and coordination of supporting fires of all arms. During this period, combat aviation is employed to gain and maintain air superiority and to prevent the movement of reserves and supplies into the area.

Special consideration is given during the preparation to measures designed to insure the continuity of the attack. Adequate provision is made for placing in readiness the necessary material and engineer units to clear paths through mine fields and other obstacles, to assist the advance of tanks and heavy weapons, and for the construction of roads connecting our own system with that of the enemy.

All preparations for the attack are completed as far as practicable before the occupation of final assembly positions. Preparatory measures likely to betray the imminence of the attack are carried out secretly or are deferred as long as possible.

Restrictions are imposed on those activities within our front lines and in rear areas which may disclose, to hostile reconnaissance, operations for the attack. Strict surveillance is imposed on the use of radio communication.

509. The plan of attack consists of the *plan of maneuver* and *plan of fire*. The attack unit, artillery, and other supporting unit commanders make detailed arrangements for coordinating the action of their units to carry out the common mission. (See pars. 480–482.)

In coordinating their plans, it is essential that the supported and supporting commanders carefully study the terrain in which hostile resistance may be encountered and identify the successive intermediate objectives of the attack.

An agreement is reached relative to the known targets to be engaged by the artillery and other supporting weapons. Areas to be kept under surveillance for targets appearing after the attack is launched, especially those targets in adjacent zones which are dangerous to the advance, are agreed upon. Associated commanders must arrange for mutual reinforcement of fire. If targets along the line of contact are to be engaged every effort must be made to prearrange the details of attack and provide means of identification.

510. Attack unit commanders must receive early information of their assembly positions and zones of action in order that they may make their own reconnaissances and formulate plans.

Attack units usually move at night into final assembly positions, preparatory to an attack the next morning. Movement of units into their assembly positions by day generally is practicable only when visibility is poor or when overwhelming artillery and combat aviation are available.

When tanks are employed, their assembly positions and routes of approach are reconnoitered, marked, and prepared.

511. The first *mission of the artillery* is to protect the movement into and the assembly positions of attack units. During this phase, hostile artillery and observation posts constitute its principle targets. Registration fires should be so conducted as not to disclose the impending attack. The artillery gives special consideration to those measures which will attain surprise in the opening of effective fire, gain fire superiority over the hostile artillery, and concentrate the mass of its fire on the decisive objectives.

512. *Artillery positions* are selected so that fire can be concentrated on the objectives of the attack. Defilade, concealment from air reconnaissance, and proximity to observation are sought. Sufficient time must be allowed for the preparation of firing data, establishment of signal communication, and organization of the artillery ammunition supply.

Artillery usually moves into position by echelon. The movement is frequently wholly or partly executed at night. Units assigned to positions screened from hostile air reconnaissance are moved first. The movement of artillery is regulated to avoid interfering with the attack echelon in its occupation of final assembly positions. Long-range artillery is placed well forward to be able to take under fire the most distant echelons of the defender's light and medium artillery.

513. During the advance of the attack echelon from assembly positions, the hostile artillery constitutes the principal target of our artillery fire. Superiority over the hostile artillery is indispensable for the success of the attack. It rarely can be attained after the attack is launched.

Located hostile batteries are silenced early in the artillery action. Their neutralization is maintained by a portion of the artillery in order that the mass may be employed on other missions, until again required for counterbattery fire as new hostile batteries are located. If counterbattery fire is unable to gain superiority over the hostile artillery, neutralization of the hostile observation just prior to the attack is of great importance.

514. Artillery fires prior to the hour of attack may be limited to normal fires already in progress or the attack may be preceded by an artillery preparation.

The duration of the preparation varies with the situation. A prolonged preparation is destructive of surprise and gives the enemy time to take countermeasures. The length of the preparation is influenced also by the extent to which tanks are to participate in the attack and the role assigned to them. The duration of the artillery preparation may vary from 15 minutes to several hours.

The nature of the artillery preparation depends upon its mission. Concentration of effect is greatly favored by dividing the preparation into phases.

The object of the first phase of the preparation is to neutralize the defender's artillery, destroy the most important hostile agencies of command and fire control, isolate the defender's forces from the rear, disrupt assembled hostile mechanized forces, and protect our troops from the enemy's counterpreparation fires. Artillery fire of the first phase comprises counterbattery fire; destruction fire on command posts, observation posts. and signal communication installations; interdiction and destruction fire on enemy routes of communication; destruction fire on mine fields and hostile obstacles; and concentrations on the hostile defense areas and assembled mechanized units.

In the subsequent phase of the preparation, sufficient artillery continues counterbattery fire to maintain neutralization of the hostile artillery. The fire of the mass of the remaining artillery is concentrated on the hostile defense areas.

515. During the preparation, supporting weapons fire on sensitive points in the zone of resistance. Massed air action on the immediate front selected for the main attack may be used to soften resistance. Combat aviation is concentrated against signal communication centers and reserves, with particular attention to artillery and mechanized units which cannot be covered effectively by artillery.

CONDUCT OF THE ATTACK

516. The *attack* is characterized by the positive action of fire and maneuver, combined and controlled to create a preponderance of force in the decisive direction.

517. The attacking echelon advances from its final assembly positions so as to cross the line of departure at the prescribed time. Any mass formation of units runs grave risks of incurring heavy losses from hostile counterpreparation fires and air attack. The leading echelon is therefore thin initially; its fire power is gradually built up as the enemy discloses his plan of defense.

When *fire superiority* has been gained, the leading echelon closes to assaulting distance.

518. Superiority of fire rests chiefly upon the mutual support of units in the attacking echelon, and the coordination of their action with the support of artillery, combat aviation, and supporting tanks. It depends not only on volume of fire but also on its direction and accuracy.

Fire effect is increased by enfilade action. Flanking or oblique fire is especially effective when frontal fire is delivered simultaneously against the same objective.

A convergent fire forces the enemy to defend himself against attack from several directions and creates a powerful moral as well as material effect.

Units seek to gain flanking fire by enveloping action. Flanking fire is also secured through the lateral echelonment of supporting weapons with respect to the units they support. Heavy machine guns, from positions in adjacent zones of action, deliver oblique fire over the troops in their front and protect the flanks of troops in the attack echelon. Light machine guns of rifle units follow the leading elements closely in order to take advantage of and deliver flanking fire through the gaps along the front. Units which have succeeded in gaining advanced positions deliver flanking fire across the front of adjacent rearward units.

Lateral echelonment of artillery for purpose of flanking fire increases the difficulties of fire control and of liaison between the artillery and supported units. The fire of supporting artillery is more reliable and effective when its positions and observation posts are in the zone of action of the supported unit.

519. The attacking echelon advances to assaulting distance of the hostile position under its own and supporting fires. Until the main hostile resistance is broken, attack units advance by bounds to successive terrain lines on each of which the fire support for the next bound is organized. Fire and maneuver are alternated in such manner that an attack unit, whose advance is made possible by the combined fire of adjacent and supporting units, moves forward to an advanced position and by its fire from that position assists the advance of the adjacent units.

520. Troops transported by air may be employed to seize, hold, or destroy objectives which contribute directly to the success of the main attack.

521. Artillery and other supporting weapons insure continuity of support by displacing forward in groups (by echelon), while the bulk remains in position and maintains fire. Fire is lifted successively to more distant targets as the attacking eschelon becomes endangered by it. When supporting artillery, mortar, and heavy machine-gun fires are lifted from the hostile position to permit the attacking echelon to close with the enemy, the loss of this support must be compensated for by the increased fire of the lighter weapons and by the cooperative action of tanks. (See ch. 16.)

522. Artillery supports the attack through the depth of the hostile position by successive concentrations in accordance with the requests of the supported commanders. Concentrations of artillery fire are regulated to bring the greatest possible volume of fire on objectives of decisive importance at the critical moments of the attack. Attack units must follow closely the artillery fires in order to take immediate advantage of artillery fire effect to gain ground to the front. The artillery is prepared for early movement forward to maintain close support as the attack progresses. Essential fire missions of units being displaced are distributed to units in position.

Combat aviation can be used during this period to insure the momentum of the attack by prearranged missions against targets which cannot be engaged by artillery.

523. Artillery must employ all means at its disposal (observers, liaison sections, airplanes, wire and radio communication to attack units) to obtain exact information on the location of the hostile defensive position and location of the forward elements of the attack. The attacking units must cooperate by employing all means of transmitting information to the artillery (display of panels, pyrotechnics, and various other means of signal communication). When uncertain as to the location of the attack echelon, direct support artillery takes immediate steps to establish close contacts with those elements.

524. During the attack, the supporting fires are concentrated against the fronts where the attacking echelon is making the greatest progress. Artillery fires are supplemented by fires of other supporting weapons. The fire of these weapons is used to increase the density of the artillery fire or is placed on those areas and targets which can not be effectively engaged by the artillery. When the attack echelon arrives close to the hostile position, the fire of all artillery, including that in general support, is concentrated on rearward hostile defense areas.

525. The primary purpose of close supporting fire is to prevent the enemy from manning his defensive works in time to meet the assault. Its progression to successive objectives is arranged between supporting and supported commanders. It may be regulated by a time schedule based upon

a. A signal given by assaulting troops.

b. A probable rate of advance of the attacking troops.

c. A desirable duration of fire.

Other fire is placed on critical points in the hostile position to protect the attack echelon from hostile long-range and flanking fires and from counterattack. It is lifted to correspond with the advance of the attacking echelon.

526. Each attack unit uses the close supporting fires of its artillery and other supporting weapons to close with the enemy and to push on to its successive objectives without deviating from the prescribed general direction of attack.

527. It is desirable that combat aviation support the attack through the depth of the hostile position by concentrated attacks on that part of the front where the attack seeks decisive results. (Coordination with combat aviation will be in accordance with FM 100–20 and 31–35.)

528. The attack must not permit its advance to be long arrested by hostile chemical concentrations. Contaminated terrain which cannot be avoided is posted and passed with the protection of gas masks.

529. Whether the main attack is based upon an envelopment or a penetration, the battle generally develops into local conflicts along two opposing fronts. During the course of battle, the combat action of units may undergo a change as between envelopment and penetration. A force that has successfully enveloped the enemy's flank may have to make a frontal attack to defeat a hostile reserve, or may find a favorable opportunity to attack the hostile resistance in flank. In a penetration, once minor resistances have been overrun, the outflanking action of small units is the most effective means of reducing the stronger hostile defense areas.

530. An attack seldom is executed exactly as planned. As long as the enemy has any freedom of action, unexpected difficulties are encountered which culminate in a crisis. The approach of this critical phase of the attack must be recognized by the commander so that timely measures can be taken to shape the course of action to secure a favorable outcome or to prevent a reverse. (See pars. 458–464.)

531. As the attack progresses, more control will of necessity have to be decentralized to subordinate commanders to permit them to meet the rapidly shifting situation. Means must be provided these commanders to permit execution of the mission assigned them.

Reconnaissance aviation must also continue to inform higher commanders concerning developments farther in rear of the battle front, such as shifting of hostile reserves, arrival of reinforcements, and train movements. From these reports and other information, commanders direct the movements of reserves toward those portions of the hostile front that offer the greatest prospects for decisive success, and to support the attacking troops in repulse of counterattacks. Combat aviation may be effectively employed to attack enemy reserves and counterattacking forces.

532. In an attack of a stabilized front, the approach has already been effected and the attack opens with a coordinated assault. The hour of the assault is fixed by the commander of the whole front from which the assault is to be launched. The exact day and hour are kept secret until the latest practicable moment.

533. On a stabilized front, the period during which the opposing forces have been in contact makes available more detailed information of the enemy's defensive dispositions. The completeness of information will depend upon the length of time the front has been stabilized and the efficiency of intelligence measures. Available information is augmented by continuous reconnaissance. Reconnaissance throughout preparation for the attack is conducted in such manner that the appearance of normal activity is maintained. Information is disseminated in the form of intelligence summaries, maps, and air photographs.

THE ASSAULT

534. Against a strong resistance and well-organized defense, the superior commander will prepare the assault by concentrating the firepower of all supporting weapons to neutralize the enemy and wear down his power of resistance before launching the assault. After the first onrush, a series of local assaults delivered by units of varying strength on their own initiative continues the action. Each unit delivers its assault at the earliest moment that promises success.

The commander of the unit will have arranged to deliver the assault on a time schedule, or will notify the supporting weapons, by a prearranged signal, that he is about to assault. The intensity of supporting fires is increased. Under cover of the supporting fire, the assault unit advances close to its objective. When the supporting fires are lifted from the objective, the assault unit overruns the hostile resistance in a single rush. Any delay in launching the assault after the fires lift allows the enemy to man his defenses.

CONTINUATION OF THE ATTACK

535. After the assault of an organized position, the attack often breaks up into a series of separate combats which are continued throughout the depth of the hostile position. These combats are directed by subordinate commanders within their zones of action and are supported by all the means at their disposal. The first task is to capture assigned objectives. Resistances are reduced by fire or are outflanked.

Reserves are disposed behind points where the greatest progress is being made, to protect the flanks of the leading units and support them in the repulse of counterattacks. All reconnaissance agencies search for probable assembly areas of hostile reserves, so that enemy preparation for counterattack may be broken up by artillery fire and air attack. If the attack is unable to make further progress, the captured terrain is promptly organized for all-around defense and held until the attack can be continued.

536. Road conditions, the possibility of maintaining ammunition supply, and the enemy's reaction following our successful assault determine when and in what strength the artillery will be moved into advanced positions.

Artillery executes its missions with the fewest possible changes of position. Frequent changes of position reduce the volume of fire support. The occupation of new positions and renewal of fire require considerable time. Nevertheless, change of position should be made unhesitatingly when fire effect or deficiency in liaison with the attacking echelon requires it. Changes of position generally are effected by echelon after timely reconnaissance of advanced positions.

Artillery promptly fires upon enemy troop assemblies, troops forming for counterattack, and on any rearward position on which the enemy attempts to reconstitute his defense.

537. If the tide of battle turns against the enemy, he may endeavor to disengage his forces and renew the defense on a rearward position, or he may fight a delaying action until battle can be renewed under conditions more favorable to him. Ordinarily, the enemy will strive to hold out until nightfall and effect his withdrawal under cover of darkness.

Frequently the enemy will disclose his intentions to withdraw. Attacking troops must exercise great vigilance in observing the conduct of the enemy in their front, press their attack with energy and maintain close contact with him. Reconnaissance aviation searches the rear areas for indications of retrograde movements of artillery and trains.

538. If the enemy succeeds in withdrawing his major forces from action, the commander intensifies reconnaissance to obtain the necessary information upon which to decide what line of action to follow. Aggressive action may prevent the enemy from reconstituting his defense on a rearward position. If the enemy succeeds in occupying a new position during darkness, a renewal of the attack in force must be delayed until daylight.

It may be of great advantage to regroup the attack forces during the advance to the new position and launch the main attack on another part of the front. Effort is made to exploit the moral ascendency by a quick and powerful blow before the enemy can reconstitute his defense. The action of tanks or armored units and combat aviation at this time may be decisive.

539. If the enemy is fighting a delaying action on an extended front, the objective ordinarily will be attained more quickly by concentrating on a decisive part of the front and attacking with energy and dispatch. An attack pushed deeply and energetically through the hostile front will force the enemy to an early evacuation of the whole front.

540. In case of a break-through, armored units penetrate deeply into the hostile position and attack the enemy's reserves, artillery, and command and signal communication centers. The gap is widened by attacking its flanks. Other mobile forces are sent through the gap to exploit the advantage gained and to attack the enemy in rear and prevent his escape. At this time the maximum efforts of combat aviation may be concentrated in cooperation with the ground forces exploiting the break-through.

541. When the attack does not reach its objective or does not break through the hostile position during the day, foot troops intrench themselves at the points reached. The night is utilized to extend the advance. Strong patrols with machine guns are sent forward to occupy advanced positions. The foot troops advance and intrench in a new position under the protection of these patrols. Several advances of this character may bring the troops within assaulting distance of the hostile position.. These night advances must be coordinated with the artillery and combat aviation.

RELIEFS TO CONTINUE THE ATTACK

542. In offensive combat, a relief may be necessary to continue the momentum of the attack with fresh troops; to change the direction of the attack, or to extend an envelopment; or to initiate a strong offensive on a front where stabilization has existed.

543. When a relief is necessary, warning orders are issued by each commander (higher commander, relieving unit, and unit to be relieved) to each of his subordinate units. Warning orders include: approximate hour the movement for the relief is to begin; zones in which relieving units are to operate; and the restrictions imposed upon reconnaissance parties as to size, routes, and hours of operation.

544. Personal reconnaissance by the commander and staff of the relieving unit and prior conference with the commander and staff of the relieved unit are highly desirable. When neither is possible, relieving units move forward to attack without delay, reconnoitering as they go. As they move forward, commanders make every effort to locate commanders of units to be relieved.

545. A plan is formulated and orders are issued covering the movement of relieving units. Fundamentally the operation is the same as the development of a command for combat. In the preparation of the plan, restrictions imposed by higher authority because of other traffic in the zone of advance to relief, the greater road spaces that may be required because of increased distances between units, the road net, and practicability of cross-country movement must be considered. The plan must be flexible as to times and routes of movement. The size of the unit involved and the speed with which the relief must be conducted will govern the thoroughness with which the details of the plan are prepared.

546. In accordance with the plan of the higher commander, commanders and staffs of both the relieving and relieved units arrange and agree upon such details as guides, use of roads, fire support to be furnished by the relieved unit, security measures which will be provided for the incoming troops by the unit to be relieved, transfer of the existing signal communication system, administrative matters, and the time command passes to the relieving unit.

547. The principal task involved in a passage of lines is the preparation for continuing the attack. Therefore, the incoming commander must assume command of the zone of action before his troops reach their attack positions.

548. Units to be relieved furnish guides. Guides meet the relieving unit before it enters the area and conduct it to assembly positions. Whenever possible, guides are furnished for units down to and including the platoon.

549. The plans for executing the relief must be in harmony with the plans for continuing the attack.

When the relief is executed in darkness, troops relieved are withdrawn promptly from the zone of action before the attack is continued. Artillery of the relieved unit (and frequently other supporting weapons) may be held in position to support the attack.

When the relief is executed in daylight, troops relieved or passed through remain in position and continue the fire support of the new unit until their fires are masked and until the attack has progressed far enough for the relieved troops to be assembled and reorganized without undue casualties.

550. If the exact location of forward elements to be relieved is known, and if relief is effected at night, the line of departure for the attack is the line held by the forward elements. When the exact location of the most advanced elements of unit to be relieved is unknown, the line of departure must not be forward of the line held by most advanced elements whose location is known. In daylight and terrain permitting, a line of departure between the forward elements to be relieved and a covered position close in their rear may be better than a line coinciding with the front-line elements.

551. To disclose the fact that a relief is in progress invites disaster—a heavy bombardment by air and artillery, a counterattack, or both—at a time when congestion and traffic circulation are doubled.

552. In reliefs on a scale large enough to require more than a single night, troops and transport of the relieving unit are concealed during periods of visibility. The relief is carried out by echelon. To prevent the discovery of the relief through the capture of prisoners by the enemy during an intervening day or night. front-line elements are relieved during the last night preceding the resumption of the attack.

Woods, fog, and defilade are utilized in the approach when the relief is made in daylight. Smoke is placed on hostile observation posts and hostile forward elements. Mobility, ruses, feints, and demonstrations are exploited.

553. During the course of the relief, artillery maintains its normal fires, but is prepared to execute counterbattery and protective fires along the front of the relief in the event of a counterpreparation or of attack

by the enemy. During a night relief, artillery fires may be so timed as to conceal noise of motor vehicles or tanks moving up into position.

Section IV. ATTACK FROM THE DEFENSIVE

PLANNED DEFENSIVE-OFFENSIVE

554. A commander with an offensive mission may decide to assume the defensive initially because of temporary combat inferiority or to create a situation which will place the enemy at a tactical disadvantage and offer opportunity for a decisive counteroffensive. In either case, an early adoption of the offensive to attain the objective is contemplated. By inducing the enemy to attack first, the commander hopes to fix and exhaust him and then, when he is disorganized, to launch the counteroffensive.

This type of action demands the highest type of leadership and tactical skill and troops with a high order of training. The major problem for the commander lies in timing the attack.

555. The selection, occupation, and organization of the defensive position conform to the general doctrines discussed in sections I and II, chapter 11, except that organization of the ground is not as complete as is required for a protracted defense and a larger proportion of the close-combat elements of the command are assembled concealed in a position favoring the execution of the contemplated counteroffensive.

556. Conduct of the defense conforms to the doctrine discussed in section II, chapter 11.

As soon as the purpose of the initial defense has been accomplished, the counteroffensive is launched. Thereafter, the conduct of the action is that of the attack.

557. A defending force frequently has an opportunity to adopt the offensive. When a general counterattack launched by the defender throws the attacker back following an apparently successful advance, or when a hostile attack breaks down, the enemy seldom will be able to withstand a determined counteroffensive. The enemy artillery fire still may be superior but his attacking echelon will be disorganized and signal communication in his forward area will be disrupted. If the defender seizes the initiative and passes to an offensive before the attacker can recover from his disorganization and can properly dispose his reserves, results often are decisive. The defense must be prepared to pass to the offensive and exploit the results of successful defensive action.

558. The general doctrines governing the preparation for and conduct of an attack are applicable to the counteroffensive.

Section V. PURSUIT

559. The pursuit is launched when the enemy is no longer able to maintain his position and endeavors to escape by retreat. A commander recognizes success by the continued advance of his troops in a decisive direction and the capture of critical objectives: by the number and morale of captured prisoners; by the number of abandoned weapons: by the numbers of hostile dead; by the diminution of hostile artillery fire: by the relaxation or cessation of hostile countermeasures; and from reports that the enemy is withdrawing.

560. When a commander recognizes that the enemy is having difficulty in maintaining his position, he utilizes all means to maintain the continuity of the attack and to exert a relentless pressure on the defeated enemy.

Effective pursuit requires leadership and exercise of initiative to the highest degree in all echelons of command. All commanders in the attack echelon spur on their troops and clinch the advantage with their reserves. Pursuit of a defeated enemy is pushed to the utmost limit of endurance of troops, animals, and vehicles. Abandoned enemy matériel is promptly put into use to augment that of the pursuing force or to replace losses. No opportunity is given the enemy to reorganize his forces and reconstitute his defense.

561. The object of the pursuit is the annihilation of the hostile forces. This can seldom be accomplished by a straight pushing back of the hostile forces on their lines of communication. Direct pressure against the retreating forces must be combined with an enveloping or encircling maneuver to place troops across the enemy's lines of retreat. Encirclement of both flanks of the retreating forces or of their separate elements is attempted wherever conditions permit. Mechanized units are particularly suited for this purpose.

By the coordinated employment of every available agency of destruction and terrorization, the shaken morale of the defeated enemy is converted into panic. The incipient dissolution of his organization is transformed into rout.

562. In anticipation of the time for launching the pursuit, the commander causes preparatory measures to be taken. These measures include necessary plans and orders in all echelons. Reserves are regrouped and motorized. Artillery and other necessary units are attached to the direct pressure forces for the pursuit. Distant objectives are assigned to the principal tactical groupings. Missions are assigned to the artillery in general support to obstruct movement on hostile avenues of withdrawal. Combat aviation is employed against those targets of opportunity and other objectives which will contribute most to the success of the pursuit.

563. The pursuit is conducted on a broad front. Motor transportation, including transportation captured from the enemy or abandoned by him, is employed to expedite the movement of foot troops. Troops before whom the enemy is giving way send in their reserves to gain his flank and rear or to break through his covering troops.

564. The forces engaged in the direct pressure and in the encircling maneuvers are assigned directions, zones of action, and objectives designed to bring the pursuit to a decisive conclusion. Such directions and zones of action may be around the flanks or through the wider gaps which defeat has opened in the hostile dispositions, or may be a continuation of the existing zones of action.

565. Combat aviation concentrates on critical points on lines of communication in the enemy's rear area, on hostile columns in retreat, and on hostile reserves endeavoring to reconstitute the defense. It attacks defiles on the enemy's line of retreat and disrupts traffic on the main roads and railroads in the enemy's rear area. Reconnaissance aviation reconnoiters vital points along the roads in the enemy's zone of retreat to keep contact with retreating columns and to locate any movement of hostile reinforcements, and keeps ground commanders informed of the hostile activities and movement within their zones of action.

566. The employment of artillery is based upon the maximum exploitation of the mobility of lighter pieces and the long range of the heavier types. So long as the withdrawing enemy can be engaged with observed and planned fire, a portion of the artillery remains in position to fire on the more distant targets.

The artillery attached to the pusuing forces, in addition to its supporting action, fires on hostile elements attempting to form columns in rear of the enemy's covering troops, and gradually takes over the missions of the artillery remaining in position.

567. The purpose of the encircling maneuver is to get in rear of the defeated enemy and halt his retreat so that he may be destroyed between the direct pressure and encircling forces.

When practicable, mobile forces in the encircling maneuvers advance along roads paralleling the enemy's line of retreat to cut him off at defiles, bridges, and other critical points. When the encircling forces cannot outdistance the enemy, they push through to a critical locality and engage the enemy's main forces in flank.

Armored and motorized units are employed in the encircling maneuvers and combat aviation may be coordinated with these maneuvers. The employment of airborne troops to seize defiles or other critical terrain objectives deep in the hostile rear, pending the arrival of more powerful mobile encircling forces, may contribute decisively to a successful pursuit.

568. The advance in the decisive direction must be maintained. Hostile rear guards or forces on flank positions must not turn pursuing forces from the decisive direction. Every effort must be made to block the main hostile force. When necessary, a new encircling force to continue the pursuit is constituted.

When the enemy succeeds in establishing himself in a position from which he cannot be dislodged quickly, the superior commander takes prompt measures to coordinate the attack again, supporting it with all available means. (See pars. 538 and 539.)

569. The enemy's attempts to organize his retreat under the cover of darkness must be frustrated. Under no circumstances must he be allowed to break contact. Units which have advanced without serious opposition continue their march during the night. Other units organize successive limited objective attacks against the enemy in their front.

During a night pursuit, the leading detachments push their advance along all available roads, followed by the main pursuing forces. The attached artillery advances by echelon, going into successive positions from which it can interdict the enemy's routes of retreat by map firing or by fire directed by observers which accompany the leading detachments. Prompt report is made when objectives are reached so that artillery fires may be coordinated.

Combat aviation searches enemy routes of retreat with flares, and attacks enemy columns and critical points in the enemy's rear area.

570. Pursuit requires extensive reliance upon radio for communication with the leading troops. The importance attached to hostile interception of radio communication in other situations does not obtain in equal degree in pursuit. Effort is made to intercept the enemy's radio messages. The construction of wire lines is concentrated along the more important axes. Command posts or advance message centers are established close behind the leading troops.

571. Adequate provision for the supply of ammunition and motor fuel to the pursuing troops is essential to the success of the pursuit. Every opportunity must be seized to augment supplies of all kinds from captured or abandoned stocks. The commander must relieve the pursuing columns of all worries concerning supply and evacution.

Section VI. SECURITY IN THE OFFENSIVE

572. Success or failure of an offensive is dependent in a large measure upon the action taken to protect the command from hostile reaction. Open flanks are highly vulnerable. The best security is to keep the enemy so heavily involved that he has no time or means available to endanger the success of the attack. Security of attack forces is assured by a timely search for information in all directions from which a hostile threat may come, by the proper disposition of security forces of ample mobility and combat power, and by prompt dispatch of accurate information and orders to security forces. This is particularly true in security against hostile forces of great mobility such as air, tank, motorized and cavalry units. In offensive operations, the service of security is performed in accordance with the general doctrines discussed in chapter 7.

573. In offensive operations, the mass of available means for defense against air and mechanized attack is disposed to favor the main attack. The combat means for defense against air attack are supplemented by utilization of cover, defilade, dispersion, and night movements to the maximum. The combat means for defense against attack by tanks or other mechanized forces are supplemented by utilization of natural and artificial obstacles to protect the flanks and rear of the command, by dispersion, and by night movements. (See chs. 7 and 11.)

574. Antitank guns in each echelon of troops are disposed to cover the most likely avenues of approach of hostile mechanized units; the bulk of the antitank guns are held mobile, prepared to meet a hostile mechanized attack at any point. Protection against mechanized attack is best assured through the use of strategically located obstacles strengthened by demolitions and mines and protected by mobile antitank guns supported by every available and effective means of fire support. Such action isolates and destroys the hostile mechanized forces.

575. In offensive operations. the greatest need for security exists during critical phases of the battle. Security is enhanced by meeting possible threats with heavy fire before they can develop. The action of combat aviation against highly mobile threats and against close, less mobile threats is particularly effective, especially if hostile troops or vehicles are in close formation.

Section VII. TERMINATION OF OFFENSIVE ACTION

576. An offensive action once begun is halted only by hostile reaction or by other elements in the situation which demand it.

If, during the course of an attack. it becomes necessary to pass to the defensive. the leading foot elements intrench themselves on the ground held. The leading echelon then is thinned out and forces are redistributed to organize the defense in depth. It may be necessary to move some elements to the front or rear for short distances to establish the defense on favorable terrain and secure flanking fire. Since any major adjustments attempted in daylight will probably result in heavy casualties, the general position of attacking units is maintained until darkness. when the selected defensive position is occupied and organized as described in chapter 11.

If the situation demands major adjustments in daylight, they are accomplished under protection of fog or smoke, and maximum fire support by artillery and other supporting weapons. Combat aviation may be employed in coordination with the other forces.

577. If, during the course of an attack, it becomes necessary to break off the action and withdraw, the command initially passes to the defensive. The completeness of the defense is dependent upon the situation and whether the initial defensive and the withdrawal must be executed in daylight or darkness. Thereafter, the withdrawal is executed according to the doctrines discussed in chapter 12.

CHAPTER 11

THE DEFENSIVE

Section I. ORGANIZATION FOR DEFENSE

GENERAL

578. The general object of defensive combat is to gain time pending the development of more favorable conditions for undertaking the offensive, or to economize forces on one front for the purpose of concentrating superior forces for a decision elsewhere.

Under the first of these objects, a commander may assume the defensive pending the arrival of reinforcements, or he may be thrown on the defensive by inferiority in numbers, disposition, or training. He may take up a defensive position and invite attack as part of a deliberate plan to win the battle by a counteroffensive.

Under the second object, the defensive is usually expressed in the mission received from higher authority. This mission may be to hold a vital area pending completion of the maneuver of other forces to protect a flank, or to contain an enemy force while an offensive is being conducted on another part of the front or in another theater.

579. Our defensive doctrine contemplates the organization of a *battle position* to be held at all costs, and the use of covering forces to delay and disorganize the advance of the enemy and to deceive him as to the true location of the battle position. (See par. 591.)

RECONNAISSANCE AND SELECTION OF POSITION

580. The mission, the situation, and the terrain limit the choice of localities where the defense may be offered.

Commanders of large units usually determine from the map the general location of the battle position.

The position on which battle is offered must conform to the object of the defense and should facilitate future maneuver without jeopardizing the success of the defense. It must force the enemy to a direct attack or a time-consuming maneuver. as a position that can be readily avoided has no defensive value. A flank position must draw the enemy from his original direction of advance.

581. Reconnaissance of the position is as detailed as the situation permits. It includes a study of the principal routes of hostile approach, terrain available for hostile observation, and the corridors most advantageous to the hostile attack. A study of the terrain in which the enemy must carry out his attack will give valuable indications of his possible assembly positions, the location of his artillery, the terrain favorable for attack by his mechanized forces, and the area most advantageous for his main attack.

582. If contact with the enemy has not been made, the commander ordinarily is free to make a detailed reconnaissance of position, select the terrain on which to defend, and decide on the best distribution of troops. In this case, the command usually is developed into an assembly position preliminary to deployment for defense.

583. Basing his action on his mission, his personal reconnaissance, the reconnaissance reports of his subordinates, and the available information of the enemy and friendly troops, the commander forms an estimate of the enemy's capabilities and the probable front of hostile attack, and makes his decision regarding the location of the main line of resistance, the employment of the artillery, the assignment of sectors, the strength and location of the general reserve, the antimechanized defenses, and other measures necessary for security. Successive reconnaissances by lower commanders fix on the ground the distribution of smaller units and the location of their combat emplacements. Exact information as to the trace of the main line of resistance is furnished to the artillery.

584. In the hasty assumption of the defensive from a march formation, reconnaissance usually must be curtailed and the defense assumed directly from the development.

Depending on the mission and the situation, it may be advisable for a commander initially to attack in order to seize terrain to his front on which to organize the battle position. In other situations he may employ a covering force, organizing the battle position on terrain in rear.

585. *Continuous reconnaissance and observation* of the enemy's dispositions are conducted to secure the earliest possible indications of the enemy's offensive preparations. Air reconnaissance may provide, either by visual means or photographically, the information concerning the situation in rear of the enemy's leading elements.

586. The character of the terrain exercises a decisive influence on the selection of position. Ridges and valleys generally parallel to the front of advance constitute obstacles to the progress of an offensive and are natural lines of resistance for the defense. Such ridges often afford observation and fields of fire favorable for a defense in depth.

Natural obstacles (e. g.. river lines, woods, swamps) are important factors for consideration, especially if the situation requires that protective measures be taken against mechanized units, or other mobile forces, such as horse cavalry or motorized units.

Commanding elevations and ridges delimit the compartments of terrain and form the framework of the system of observation, command, and fire control in combat. They determine directly the location of the observation posts and positions of the artillery and other supporting weapons, and indirectly the location of defensive and assembly positions.

As a general rule, long gentle slopes afford better conditions for defense than abrupt elevations. However, positions along commanding heights are suited for delaying action.

587. The *battle position* is so selected as to use the terrain to the greatest advantage. The extent of the position must be appropriate to the available troops.

The most important terrain factors are adequate artillery observation, good fields of fire, concealment from hostile observation, and the presence of natural obstacles. The relative importance of these terrain factors depends upon the strength, composition, armament, and mission of the defending force, together with a consideration of the enemy's capabilities.

In selecting the forward limit of the battle position, the defender seeks terrain which will permit the most effective employment of the fires of artillery and other weapons. Clear fields of fire for small arms are important and usually lead to the location of the main line of resistance on a forward slope. Considerations of concealment and the ability to escape the annihilating effect of enemy observed fire, particularly from direct fire weapons may, however, dictate the selection of a reverse slope position. Such position is practicable when possession of the crest to the front is not essential to the observation of fire or when the forward slope is otherwise unsuitable for defense.

When the forward limit of the position is on the forward slope, the defense areas of front-line battalions may be extended to the rear to include the reverse slope. When it is located on the reverse slope, front-line battalions establish detachments on the forward crest to fire on attacking troops during their approach to the position.

Observation to the limit of range of the weapons is desired in front of the main line of resistance, as well as within the battle position. Adequate observation posts for artillery are essential. The battle position must be so located that the essential observation will be retained even though the enemy succeeds in penetrating into the position.

Maximum advantage is taken of natural and artificial obstacles to stop attack by mechanized units or limit the directions of their movement. Towns, villages, and cities have considerable defensive strength against mechanized attack. They are, however, vulnerable to air attack, especially by incendiary bombs.

588. All parts of a position will not have the same defensive strength. Avenues of approach which enable the attacker to reach the position under concealment or cover are sources of weakness. These avenues of approach may, however, be unsuited for enemy tank attacks. Clear fields of fire over which the enemy must advance for some distance under the defender's fire are sources of strength in a defense against foot troops, but may furnish excellent terrain for hostile mechanized attack. The defender must be prepared to meet that form of attack which the terrain favors.

589. A position combining all defensive advantages will seldom be available. The weak points of a position are strengthened. A short field of frontal fire is compensated by dense flanking fires and heavy mortar and artillery concentrations; exposure to hostile observation, by distribution in depth and construction of dummy works and masks; deficient observation, by increased strength of local garrisons. Persistent chemicals, demolitions, and mines can be used effectively to strengthen exposed flanks and to contaminate and block covered avenues of approach leading into the position.

590. The defense, no less than the offense, must effect *surprise.* The organization of a defensive system must not betray the defensive dispositions. They should mask the real defensive organization. Every available means must be employed not only to mislead the attacker as to the location of the position but also as to the strength and disposition of the defending force. Deception, delay, and security are obtained through the use of covering detachments.

TACTICAL ORGANIZATION

591. The defense is built around a series of tactical localities, the retention of which will insure the integrity of the position. A battle position comprises a zone of resistance consisting of a number of mutually supporting defense areas disposed irregularly in width and in depth, each organized for all around defense with trenches, fox holes, obstacles, and emplacements. Tactical unity is maintained in each defensive area.

A line joining the forward edge of the most advanced organized defense areas is called the *main line of resistance.* It is the line in front of which all elements of the defense must be able to concentrate their fire to break up the hostile attack. The contour of the main line of resistance is thus irregular in trace, with elements on it sited for frontal and flanking fire.

592. The distance between successive echelons on the battle position (units on the main line of resistance, company supports, battalion reserves, and regimental reserves) should not exceed the effective range of small-arms fire. It should be sufficiently great, however, to prevent any echelon from falling into the zone of dispersion of artillery fire directed against a more advanced echelon. This distribution in depth diminishes the effect of hostile fire and provides for continuity in defensive fires and movement against the enemy, even though he succeeds in penetrating into the battle position.

593. The natural defensive strength of the position has a direct bearing upon the distribution of troops for its defense, both as to frontage and depth. The all-around defense of mutually supporting vital tactical localities (key points) is of paramount importance. Portions of the front which have great defensive strength can be held with fewer men, or units can be assigned wider sectors, while the reverse is true in weak portions of the front. Some portions of the front may remain unoccupied yet be held effectively by a combination of firepower and obstacles. Close terrain and exhausted troops require a greater density of troops forward toward the main line of resistance. For details of infantry defense see FM 7–20 and 7–40.

594. The *width of sectors* assigned to infantry units varies with the natural defensive strength of the various parts of the position, the relative importance of the sectors, the degree of control required, and the number and strength of units available. The necessity for control and the character of fields of fire affect the intervals which may be permitted between tactical localities. Some variation in the width of sectors may arise from the necessity for adjusting them to fix responsibility for defense of terrain corridors. By adaptation of the width of sectors to their natural strength, there results an economy of force which enables the commander to hold out the maximum strength for use as reserves.

595. Sectors are delimited in orders by boundaries—lines indicated on the map or ground extending from rear to front. Boundaries are located so that there will be no question of the responsibility for the defense of the key terrain which dominates a critical avenue of hostile approach. While it is frequently impossible to include both the avenue of hostile approach and the adjacent dominating terrain in the sector of the small units, the boundaries of sectors assigned to battalion and larger units should be located to insure unity of defensive dispositions and fires in defense of these critical localities.

Boundaries are extended forward of the battle position to the limit of the range of the weapons with which the unit is equipped. Boundaries may be extended forward to include the outpost line in order to delineate the outpost responsibility of units on the battle position. The extension of boundaries to the rear is influenced largely by the existing road net and routes for movement within the position.

596. The division commander determines the distribution of the division artillery and its subdivision for combat (direct and general support). Since the rapid concentration of artillery fire on important objectives is essential to a successful defense. when the situation permits, control of the artillery under the direction of the division commander is preferable. Every effort is made to meet the hostile main attack with the mass of the artillery fire.

The *echelonment in depth* of the artillery takes into consideration the range of the various weapons, the location of the targets, and the possibilities of neutralization by hostile counterbattery fire. The echelonment is limited by the considerations that the entire artillery must be able to concentrate its fire in close support of the main line of resistance. that the foremost echelon can fire deep in the hostile zone, and that the rearmost can support the rear defense areas of the battle position.

597. The battle position is protected by outposts whose mission is to provide time for the main force to prepare itself for combat, to deceive the enemy as to the location of the battle position, to force early development by the enemy, and to provide a deeper view within the terrain over which the attacker will advance.

Whenever practicable the outposts are located at sufficient distance from the main line of resistance to prevent the occupying forces from being taken under observed fire by hostile light artillery. Outposts will ordinarily not be established beyond the effective range of the light artillery of the battle position.

The outpost line of resistance and the ground between the outpost and the battle position are organized for delaying action to the extent permitted by the time and labor available.

598. When forced to withdraw under hostile pressure, the outposts conduct a delaying action. Every effort is made to deceive the enemy as to the exact location of the battle position. The withdrawal of the outposts must be so arranged that they neither will interfere with nor be endangered by the fire from the main position. Coordination is facilitated by the use of prearranged signals and previously designated routes of withdrawal.

599. Whenever practicable, an advanced covering force is employed in front of the outpost. The mission of this covering force is to inflict the maximum delay on the enemy; to permit the defender to utilize advanced artillery observation: to permit the laying of mines, demolitions, and obstacles in front of the outpost and the battle position; and to deceive the enemy as to the actual location of the battle position. Similarly, such forces may be employed on exposed flanks.

600. Natural terrain obstacles. such as water courses, heavily wooded areas, and swamps, are particularly favorable areas for the operations of advanced covering forces.

The initial position of the advanced covering force and the terrain between this force and the outpost are organized to the extent practicable in the time available.

601. The advanced covering force should be mobile. The use of cavalry, armored and motorized troops, and engineers is indicated. It should have strong artillery and antitank support. Organic artillery may be reinforced by artillery from the main force, temporarily emplaced in advance of the battle position.

602. The advanced covering force fights delaying action in its withdrawal. It avoids serious engagement with the enemy.

603. The direction from which the main attack may be expected and the commander's plan of maneuver determine the initial location of the reserve. According to circumstances, it is echeloned for protective purposes in rear of an exposed flank, held in a position in readiness from which it can deliver a prepared counterattack, so disposed that it can launch the counteroffensive by striking a hostile attack in flank.

604. *Horse cavalry units* rarely should be called on to defend a position. Cavalry seeks to accomplish defensive missions by delaying action or by defensive-offensive tactics. When required to defend in position, it operates in general as does infantry.

605. *Corps and division cavalry* is employed on reconnaissance missions with especial attention to locating the mass of the hostile force. It may be reinforced by motorized infantry, artillery, and engineers, and employed as a mobile covering detachment. (See par.

579.) During battle it continues reconnaissance and security missions, especially to the flanks. It may be held in mobile reserve or used to harass enemy flanks and rear when the situation permits.

606. *Armored units* are not normally employed to hold defensive positions. They may, however, be employed well forward to cover the occupation of a position by other troops. They employ delaying action to accomplish this mission. (See ch. 12.) Should the situation demand it, they may be required to hold an area pending the arrival of other troops. In performing such a task, they operate similarly to horse cavalry except that larger reserves are withheld initially for the purpose of counterattack. When supporting infantry, they constitute a powerful striking force and are held initially in reserve prepared for rapid entry into combat when an opportunity for a counterblow is presented.

607. *General reserves* may be called upon to relieve units on the battle position, participate in a major counterattack or counteroffensive, extend the flanks of the battle position, or occupy a rear position.

Prior to commitment to a definite line of action, they are held mobile, prepared to participate in battle in accordance with the plan of maneuver of the superior commander. While so held, they are disposed for all around defense against attack by hostile forces which may succeed in passing through or around the battle position. Necessary measures are taken for protection against hostile aircraft and for countering an attack by airborne troops.

ORGANIZATION OF FIRE

608. Coordination of the fire of the infantry, artillery, antitank, antiaircraft, and other weapons is carefully planned and expressed in orders. Plans provide for bringing the enemy under effective fire as early as practicable unless the situation requires that fire be withheld to obtain surprise, and for so regulating the intensity of the fire that the enemy is subjected to progressively heavier fire as he approaches the defensive position.

609. The organization of systematic flanking fire by machine guns supplemented by other small arms constitutes the basis of defensive dispositions. Adjacent units, in addition to defending their own fronts, mutually cover one another's fronts with flanking fire. Dead spaces in bands of machinegun fire are covered by the fire of other weapons. Fire effect is increased by obstacles which hold the enemy under frontal and flanking fire. Sectors of the defensive position especially exposed to hostile fire may be left unoccupied, except at night and during periods of low visibility, and defended by flanking fire from adjacent sectors.

Machine guns are so distributed in width and depth in each battalion defensive area as to take full advantage of terrain. As far as practicable, their fire should cover the entire front of the main line of resistance with continuous bands of fire. Some machine guns are sited to take under flanking fire hostile elements which succeed in penetrating the main line of resistance. Some of the heavy machine guns are located where they can develop long-range fire during the hostile approach without disclosing the location of the main line of resistance.

Artillery fire is coordinated in the defensive plan of fire and is especially concentrated on the critical localities and on ground which is dead to or beyond the range of the fire of other supporting weapons. A considerable portion of the artillery must be capable of concentrating its fires on any enemy penetration of the battle position. The effective control of this fire requires good observation and efficient signal communication.

610. All possible measures are taken to insure security against mechanized attack. *Antimechanized defense* is organized throughout the depth of the position. The main antimechanized defensive effort is made in areas which are favorable to the employment of mechanized forces. Battalion and regimental antitank guns from concealed positions defend the forward part of the battle position, while antitank weapons of higher units are echeloned farther in rear. Positions and routes for these weapons are reconnoitered. and the guns are held in readiness prepared for rapid movement to any threatened part of the front. (See also ch. 7 and sec. V, ch. 11.)

Through a judicious combination of antitank weapons and obstacles, aided by artillery fire, tanks, and tank destroyers, attacks by mechanized forces are broken up and halted as soon as they are disclosed.

611. The division artillery commander prepares the general plans for the employment of artillery in accordance with instructions of the division commander. Coordination between artillery fires and those of other weapons is essential. It is effected principally through liaison between artillery units and the units they are designated to support. The close support of the main line of resistance is a governing consideration in the formulation of all artillery plans.

612. The *artillery plan of fire* is based primarily upon the execution of a counterpreparation to break up or cripple the hostile attack before it can be launched. Fire is not opened by the mass of the artillery until targets of sufficient importance are disclosed.

It is important to take hostile artillery under fire at an early moment, to interdict hostile routes of approach, and to dislocate the hostile system of command and fire control.

The artillery of the attacker is most vulnerable from the moment it comes within range of the defender's artillery until it has completed its deployment. During this period, it constitutes one of the principal targets of the defender's artillery fire and aviation. The fire of all available artillery is concentrated to cripple the hostile artillery before it can get into action. *Counterbattery* continues to be the principal mission of a portion of the artillery, especially the medium artillery, throughout the battle.

The corps gives the division instructions regulating the employment of the division artillery in the execution of its more distant missions. The corps reinforces the action of the division artillery and extends its sector of fire in depth by the use of the artillery at its disposal. Long-range destruction and interdiction fire is directed especially on sensitive points in the enemy's rear areas and on his lines of communication (bridges, crossroads, and supply establishments).

613. *Combat aviation* attacks hostile ammunition and other supply establishments, airdromes, railroad installations, and bridges important in delaying or dislocating the hostile preparations for attack. Other remunerative targets for combat aviation are enemy columns, artillery in position, reserves, and mechanized forces.

614. *Antiaircraft artillery* is disposed initially to protect the organization and occupation of the battle position.

When the commander has determined on what front the enemy is making his main attack, the antiaircraft artillery concentrates its efforts on preventing air reconnaissance and attack on the threatened parts of the defensive position, and on protecting the employment of reserves for counterattack.

If sufficient antiaircraft artillery is available, some units are assigned to the defense of important roads and installations (railheads, ammunition establishments, and airdromes). The antiaircraft artillery intelligence service gives prompt warning of the approach of hostile aircraft to all units concerned. (See par. 58.)

Antiaircraft artillery weapons are sited so they may be employed against attack by mechanized vehicles when this can be done without interference with their normal missions. In the event of simultaneous attack from hostile aircraft and mechanized vehicles, fire must be concentrated against the more dangerous threat.

ORGANIZATION OF THE GROUND

615. The organization of a position is limited only by the time and facilities available. Protection is to be sought in the distribution of defenses in depth and in width, their adaptation to the terrain, concealment from hostile observation, and in the strength of construction. From the beginning, great care is taken to conceal the most important works by *camouflage* or natural terrain features. Measures for increasing the effect of fire and for providing adequate signal communication take precedence over the construction of field fortification.

616. Troops carry out the organization of the position in accordance with a plan of construction expressed in orders in the form of priorities. After the location of combat emplacements has been fixed, priority is given to clearing the field of fire, to removal of objects masking our own observation, and to the determination of ranges to points in the foreground. These measures are followed ordinarily by the construction of the various defensive works and obstacles, and by the preparation of routes of approach for reserves and for ammunition supply. Primary consideration should be given to provisions for camouflaging the works as they are constructed. Work may proceed simultaneously on several items.

Artillery and heavy weapons units give priority to the construction of observation and command posts and signal communication systems, and provision for the supply of ammunition. Shelter is constructed for personnel, and provision is made for camouflage of ammunition dumps and the protection of ammunition against the weather. For the protection of guns, more reliance is placed upon camouflage and provision for alternate positions than upon the fortification of gun emplacements.

617. In the construction of *obstacles,* wire entanglements are sited so that their outer edges can be swept by flanking fire. Other obstacles are coordinated with demolitions. All obstacles are covered by fire to hinder their removal. They should be concealed from hostile observation.

618. *Dummy works* serve to mislead the enemy and disperse his fire. To be effective, they must closely resemble genuine works; dummy works easily recognizable as such give the enemy valuable negative information. They must appear realistic.

619. Channels of signal communication are increased and alternate channels provided. Units are connected by wire lines not only with the rear but also laterally; the importance of lateral lines consists not only in affording direct signal communication between adjacent units but also in making available numerous alternative channels of signal communication between advanced units and the rear. Alternate command posts are selected and organized.

620. *Engineers* are employed to impede the advance of the enemy by the execution of demolitions and by the creation of a zone of obstacles, including mine fields and booby traps. When necessary, they defend the demolitions and obstacles which they construct. They increase the defensive powers of the other arms by the construction of field works requiring special equipment or training, by technical assistance in other works of organization of the ground, and by furnishing them with the necessary tools and engineer supplies.

They may also be employed in the siting or preparation of rear positions. In emergencies they may participate in the defense as infantry.

621. The activities of the *chemical troops* and engineers are closely coordinated. Persistent chemicals, if to be used, have especial defensive value by reason of the fact that concentrations established before the hostile attack retain their effectiveness during the course of the attack. Barriers of persistent chemicals are placed to protect portions of the front and flanks of the position and to cover defiles, vital roads, road junctions, and wooded stream lines across or along favorable routes of hostile approach. When these barriers can be placed without hostile interference, persistent chemical mines are employed; when the area is controlled by the enemy chemical barriers can be laid by aviation, artillery, or chemical mortars. In deciding to use persistent chemicals, the commander must carefully evaluate its effect on his contemplated future operations.

622. The selection of a rear position at such distance from the main position that the attacker cannot direct the fire of his artillery upon it without displacing his batteries, facilitates the conduct of a flexible defense. The extent of its organization will depend upon the situation and the time available. The forces employed in the construction of the rear position must not be obtained at the risk of jeopardizing the defense of the main battle position.

623. The development of a hastily occupied defensive position into a more strongly fortified defensive system is dependent upon the situation and the time and material available for construction. This may take place on a front which has stabilized after an indecisive battle, or is out of contact with the enemy.

624. The development of such a defensive position aims first of all to strengthen the main line of resistance, battery positions, and the command and control facilities of the entire position. The means employed include numerous communication trenches; obstacles, including tank barriers and mines; shelter for troops; observation and command posts, including alternate locations; signal communication; gun positions; and supply dumps. These works differ from those in mobile situations in the elaborateness and permanency of their construction. In areas of resistance in rear of the main line of resistance, permanent works are constructed to limit hostile penetration. All works are concealed or camouflaged.

In the siting of emplacements for defending troops, extreme care must be taken that there are no undefended approaches from any direction that would permit hostile elements to work their way in close enough to destroy the occupants with hand grenades or other close-combat weapons. Provision must be made for protecting the rear against attack by airborne troops and by highly mobile forces.

625. *Communication trenches* greatly facilitate the exercise of command, the movement of troops, and the functioning of supply. In moving situations, time will rarely be available for the complete construction and camouflage of such trenches. They are indispensable in the prolonged occupation of a position. They are constructed first over exposed stretches on the routes of approach from the rear; their entrances are conspicuously marked. As a general rule, communication trenches should not be employed as combat emplacements. They should be sited so that they will not indicate to the enemy the location of combat emplacements. Their use, however, as part of a switch position in case the main line of resistance becomes untenable, should be considered.

626. The nature of overhead cover varies with the location of the troops to be sheltered. The only forms of protection having permanent value against fire are dugouts and concrete or steel shelters sufficiently resistant to withstand high-powered artillery fire and bombs from the air. Deep dugouts in the front lines do not permit the prompt egress of troops, and in case of attack may become traps. Overhead cover for front-line troops is designed chiefly to afford splinter-proof protection and shelter from the weather. Lack of strength is compensated for, as far as possible, by the increased number and smaller size of the shelters.

627. Overhead cover is an essential means of conserving the fighting capacity of the troops in the prolonged occupation of a position.

Reserves within range of hostile artillery fire and subject to the attack of combat aviation are, as far as practicable, sheltered in bombproof dugouts.

628. In a stabilized situation, the problem of drainage assumes great importance; the siting of works with a view to effective drainage is always given due consideration.

629. In addition to the depots of large units, small dumps of ammunition, rations, and materials needed in the construction and defense of the position are established in the sectors of small units.

630. The priority of work in the development of a position which is out of contact with the enemy is determined largely by the time required for the construction of the essential works and the extent to which they lend themselves to camouflage. Provision must be made for camouflage before the work is begun. Then camouflage is carried on continuously throughout the work.

After reconnaissance and determination of the method of occupation of the position, command posts, observation posts, signal communication facilities, obstacles, and shelters for the troops are constructed. Adequate forces must be concentrated early on important works requiring a considerable period for their construction. To avoid disclosing the position, the construction of fire and communication trenches may be deferred until troops occupy the position.

Section II. CONDUCT OF THE DEFENSE

631. The defense is conducted along mobile lines. Mobility is obtained by the use of covering forces, by improving facilities for movement within the battle position, by distribution of forces in depth, and by holding out reserves capable of rapid movement. Covering forces delay, deceive, and disorganize the enemy; units in organized areas of the battle position hold their positions at all costs; reserves maneuver behind the pivots thus established. Mobile and rigid defense are combined so that possession of the areas essential to the maneuver of the defensive forces is retained, the maximum forces are made available for counterattack or counteroffensive purposes, and the enemy is deceived as to the character of the resistance with which he is confronted.

632. The conduct of the defense must be aggressive. It must be prepared to take advantage of errors or failures on the part of the enemy. The counterattack is the decisive element of defensive action. It is seldom feasible to hold a defensive position by passive resistance only.

633. The integrity of the battle position is maintained by a combination of fighting in place and counterattack.

Regardless of the considerations which dictated the adoption of a defensive attitude, the tactics of defensive combat are essentially to develop the maximum firepower against an advancing enemy, to reduce our own losses by a better knowledge and utilization of the terrain, and thereby to stop the enemy's advance or throw him back by counterattack.

634. In order to maintain itself in action in the face of hostile superiority, the artillery must fully exploit its mobility. If there are indications that the location of certain batteries has been discovered, such batteries effect a change to one of their alternate or supplementary positions.

In quiet periods, artillery units assigned to counterbattery and harassing missions may be moved to previously surveyed positions for the delivery of fire. This movement, occupation of position, delivery of fire, and return to position are generally accomplished during hours of darkness.

635. When the imminence of the hostile attack is discovered, counterpreparation fires are directed upon the hostile attack formations, artillery, and command, observation, and signal communication systems to break up the attack before it starts. A general counterpreparation involving all of the artillery with the command is fired on the order of the superior commander. Local counterpreparations designed to cover only the points threatened by a local attack are fired on the order of subordinate commanders.

636. If the enemy succeeds in launching his attack in spite of the counterpreparation, the artillery seeks to keep him under fire in considerable depth by placing defensive concentrations on his advancing attack echelons and on his reserves, and by continuing counterbattery fire. These fires are delivered on the request of supported unit commanders, or of observers following the progress of the attack with air or ground observation.

637. Finally, defensive concentrations and barrages are fired close to our troops. They strengthen the fire of other weapons covering the most dangerous avenues of approach to the positions. Barrages generally are delivered on pyrotechnic signal from the front-line troops, but may be executed on report from artillery observers that the hostile attack is threatening the integrity of the position.

Since a uniform distribution of artillery fire along the entire front is generally ineffective, plans for the delivery of concentrations and barrages are designed to provide fire on critical areas or fronts. These fires, especially the barrages, are delivered at a high rate, and involve a great expenditure of ammunition. Hence, it is essential that front-line units carefully consider the emergency in their calls for artillery support.

Provision should be made for reinforcing counterpreparation and barrage fires by artillery normally assigned to other missions, or by the artillery of adjacent divisions.

638. In addition to the artillery, other supporting weapons participate in counterpreparation and barrage fires. Their fires are coordinated with those of the artillery in the plan of defense.

639. Infantry defends its position by employing all the weapons at its disposal in cooperation with artillery fires. As the enemy comes within range, the infantry heavy weapons, including those of units in reserve, are brought into action.

640. A unit intrusted with the defense of a tactical locality *under no circumstances abandons it* unless authorized to do so by higher authority. Important localities on the main line of resistance must be defended to the last man. Local commanders take the necessary steps to maintain their positions, rectifying gaps in their dispositions or fires by the use of their supports. Plans are made for the employment of local reserves. As the area of their probable employment becomes apparent, reserves are moved to be more readily available for action.

641. When the front and direction of the main hostile attack have been determined, the defense takes final steps to meet it. Artillery and other supporting weapons deliver fires on the attacking infantry. As the hostile attacking elements come within effective small-arms range and are unmasked by the withdrawing outposts, the defending force increases its fire with all available weapons. Threatened sectors not fully garrisoned are occupied. Chemical troops, from positions well forward, supplement the fires of artillery and other supporting weapons with fires on avenues of approach and on known or probable areas occupied by the attacking troops. The bulk of the available reserves are held mobile, prepared for aggressive action.

As the enemy attack draws closer, machine guns switch their fires to their final protective lines; all weapons participate in the fire fight, until finally the enemy is stopped or driven back.

642. Reconnaissance is conducted and plans are prepared for the employment of reserves, based on the probable lines of action which may develop during combat. Reserves must be prepared to occupy a previously prepared defensive area to check a hostile penetration or an envelopment of the position, or to deliver a counterattack for the purpose of maintaining or restoring the main defensive position. Reserves are committed to the position only to the extent necessary to stabilize the situation and establish a firm base from which to launch a counterattack. Motor transportation is used to increase the mobility of reserves.

643. *Tanks* are essentially offensive weapons. They are held in reserve in a covered position out of effective artillery range until the situation is favorable for their employment. They constitute a powerful reserve in the hands of the commander either to engage hostile tanks or to support a general counterattack or counteroffensive.

644. Should the enemy succeed in penetrating or outflanking the position, the defender seeks through fire and maneuver to eject the hostile elements. The fire of the supporting artillery is concentrated on the hostile elements which have entered the position. Local reserves, supported by all available weapons and protected by smoke, counterattack against the flanks of the gap to thrust back the enemy before he has had time to establish himself. Such local counterattacks must be launched during the period of temporary confusion and disorganization which occurs when the attacking troops have entered the position and have not had time to reorganize and establish themselves. *This period is relatively short. Consequently, the counterattack must be delivered without delay, on the initiative of the local commander.* The object of such counterattack is to stabilize the situation on that particular part of the position and prevent widening of the gap, or, in case of a small penetration, to eject the enemy. Surprise, boldness, and rapidity are the principal factors which lead to successful execution. Anticipatory planning, including reconnaissance and rehearsals is essential for the prompt delivery of the counterattack. If the enemy is given time to reorganize and to place his machine guns and antitank guns in position to defend the ground he has gained, the opportunity to counterattack by local reserves probably has passed. Then only a well-prepared counterattack by larger reserves has much chance of success.

645. Should the enemy succeed in penetrating through the position with a strong mechanized attack, it is essential that units on the battle position close the gap thus created without delay, and before succeeding hostile units can exploit the success attained. The shoulders of the salient must be held at all costs. Local commanders must react promptly and on their own initiative rectify the situation.

646. If the enemy has attained such success that local commanders are unable to eject him, the higher commander must decide whether to counterattack with reserves at his disposal to restore the battle position. to continue battle on the battle position and prevent further enemy advance, or to withdraw to a prepared position in rear.

Time is required for the preparation of a major counterattack. Sufficient reserves must be assembled to carry the attack forward. Adequate fire support must be arranged. Assembly positions. zones of action, objectives, and time of attack are clearly specified. Surprise is an important factor. Employment of artillery, chemical troops and armored units is regulated and controlled by the higher commander. Whenever practicable. the counterattack is launched against the flanks of the hostile salient. Advance planning for such an operation is essential in order to reduce to a minimum the time required in final preparation.

In reaching a decision to withdraw to a rearward position, the commander must carefully evaluate the time required to reach and organize such a position and the effect of hostile mechanized and air attacks on his withdrawing forces. The rapidity and power with which mechanized units and combat aviation can strike indicate the necessity for the organization and occupation of the rearward position prior to the withdrawal of the forces directly engaged with the enemy. Reserves of higher commanders are suitably employed on such rearward positions. To order a withdrawal to an unorganized and unoccupied rear position in the face of attacks by mechanized forces and combat aviation invites disaster for the entire command.

647. When the battle is interrupted by nightfall, combat outposts are established by front-line battalions. (See par. 659.) Provision is made for patrolling and illuminating the foreground and the intervals between defense areas. Front-line garrisons may be reinforced. Machine guns are laid for their final protective fires. Provision is made to place the defensive fires of artillery and other supporting weapons in front of the combat outposts. These fires cover those areas that cannot be reached by rifle and machine-gun fire and should be prepared while there is still some daylight. They are delivered on prearranged signals from the combat outposts.

648. When the enemy succeeds in establishing himself on favorable ground at close range from the main line of resistance, it may be advisable to redistribute the defending forces in depth. In such case the main line of resistance may be shifted to the rear of the zone of resistance, and the original main line of resistance held by combat outposts: or the defense may be transferred to a rear position, in which case the preparations for a withdrawal from action and a renewal of the defense on the new position must be made in advance. (See ch. 12.) Withdrawal to a rear position is as a rule advisable only when the situation clearly shows that the first position is untenable or will soon become untenable.

649. When a stabilization of operations gradually develops, the decision must be made whether to push an outpost forward and continue to hold the present position, making the necessary rectifications, or to hold the old position as an outpost position and transfer the principal forces to a rear position (see par. 622), which then becomes the main battle position. In either case a redistribution of forces is necessary.

Measures are taken for the development and strengthening of the new defensive position. Obstacles are reinforced, additional mine fields are constructed, defense against chemicals is more thoroughly organized, shelter is provided for men and ammunition, and measures are taken to provide for the rest and comfort of troops.

650. Where a stabilized situation develops or a defense continues for a prolonged period, the necessity for conservation of the fighting power of the troops requires provision for the periodic relief of units. For the sake of continuity in the execution of the plan of defense, it is a general rule advantageous to avoid relieving the artillery and the infantry at the same time.

The relief is preceded by a detailed reconnaissance of the sector by officers of the relieving unit. If time permits, all commanders down to and including platoon leaders should visit the position prior to the relief. Commanders familiarize themselves not only with the disposition of the defending force, but with the known hostile dispositions on their part of the front. Arrangements are completed for the transfer of supplies and special equipment to be left on the position by the unit relieved. Sufficient guides are detailed from the unit to be relieved to meet each infantry platoon or similar element of the relieving force and conduct it to its position.

651. *Secrecy* in planning and conduct of the relief is essential to its successful accomplishment. The relief should be carried out under cover of darkness, and in sufficient time to permit the bulk of the relieved force to be beyond artillery range prior to daylight. Careful planning and proper supervision will prevent congestion of incoming and outgoing troops at critical points.

652. The execution of the relief takes place under the direction of the commander of the unit to be relieved; he remains responsible for the defense of the sector until the relief has been completed.

Section III. TERMINATION OF THE DEFENSE

653. An attacking enemy through his own maneuvers, losses, errors, exhaustion, or other cause, may be placed in such an unfavorable position that superiority passes to the defender. The latter then has a prospect of success in a counteroffensive, which aims at a tactical decision, the defeat and possible destruction of the opposing force. It is conducted as an offensive operation. (See ch. 10.)

654. Should the situation change to one requiring a retrograde movement, the operation is conducted as indicated in chapter 12.

Section IV. SECURITY IN THE DEFENSE

655. Prompt and continuing security measures are taken in those directions from which the enemy is capable of attacking. Measures for counterreconnaissance are taken by all troops and agencies in order to

screen from the enemy the preparations and dispositions made for defense.

656. The enemy will seek to avoid disclosing the distribution of his forces and the front of his main attack until his deployment is completed. The defense must gain contact with the enemy at the earliest opportunity and maintain such contact in order not to be taken by surprise. Every available means of reconnaissance is employed to locate the enemy and determine the direction of his advance and the distribution of his forces. Additional information relating to the outlines of the enemy's dispositions and the direction of his main attack are sought during the delaying action of the covering forces.

657. If the outpost is at a considerable distance from the battle position, the foreground of the battle position is temporarily occupied by combat outposts detailed from each battalion holding a sector of the main line of resistance.

658. The mission of the combat outposts is to provide local security and gain time for troops responsible for the defense of the main line of resistance, and to deceive the enemy regarding where the main resistance is to be encountered. As long as the main outpost position is held, combat outposts of battalions on the main line of resistance may be relatively weak. The approximate strength of combat outposts may be directed by the higher commander. When there are no friendly troops in front of them, combat outposts maintain close contact with the enemy.

659. As a rule a combat outpost is established by each front-line battalion or squadron in contact with the enemy. When battle is interrupted by nightfall, combat outposts push their patrols forward in close contact with the enemy. The action of the combat outposts in adjacent sectors is coordinated by adjacent and higher commanders.

Section V. ANTIMECHANIZED DEFENSE

660. Defensive measures against mechanized units comprise mines, special weapons, or the special use of existing weapons, natural and artificial obstacles, organization of the ground, and a warning system. (See ch. 7.) Antimechanized defense must be organized in depth.

661. The antitank gun is of first importance in antimechanized defense. Employment of antitank guns is based on the placing of guns to cover obstacles and routes of tank approach, as a first echelon of antitank defense, with the balance of the guns held as a mobile reserve. Based on information of hostile mechanized forces, reserve guns are moved rapidly to previously reconnoitered locations and so disposed in depth as to permit timely reinforcement of areas threatened by hostile mechanized attack.

Guns intended solely for antimechanized use are kept concealed until their special target appears as their effectiveness is jeopardized if their location is prematurely disclosed. Close-in protection of antitank guns is coordinated with other troops.

662. Weapons whose primary missions are against objectives other than mechanized units are used also against mechanized vehicles to the limit of their effectiveness. Small-arms and machine-gun fire has a limited effect, interfering primarily with the enemy's observation. High explosive and incendiary hand grenades are effective against certain types of armored vehicles.

663. In the use of all direct-laying weapons, fire against mechanized vehicles is withheld until they have come within effective range.

664. Tank destroyer units are effective means to counter hostile mechanized forces. The self-propelled tank destroyer must utilize its mobility to gain an advantageous position from which to intercept hostile tanks, and deliver surprise fire against the enemy mechanized force. Their employment must be closely coordinated with and supported by other ground forces. Towed tank destroyer battalions can be used to strengthen and deepen the antitank gun defense and provide additional mobile reserve. Towed tank destroyer guns are more suitable for advanced positions than self-propelled ones, since they are more easily concealed.

665. All supporting artillery must be prepared to assist in antimechanized defense. In both offensive and defensive action, provision should be made for the rapid concentration of as much artillery fire as possible on all areas favoring the assembly and maneuver of mechanized units, particularly on any defiles leading to such areas. Antitank weapons furnish the main defense against armored vehicles. However, when a strong hostile mechanized attack is imminent, light artillery may be moved to positions from which to counter the hostile mechanized vehicles by direct laying.

666. *Antiaircraft artillery weapons* are suitable for use against mechanized vehicles. Every effort is made to assist in antimechanized security by siting antiaircraft artillery weapons so that they may be employed against mechanized attack. In the event of simultaneous attack by hostile aircraft and mechanized forces, fire must be concentrated against the most dangerous threat. For maximum effect against mechanized vehicles, special armor-piercing ammunition must be provided.

667. Large *tank and tank destroyer units* are effective means to counter hostile mechanized and armored forces. They must be used offensively in large groups on definite counterattack missions, usually for maneuver to deliver a surprise blow against the flanks and rear of the hostile mechanized force. Their employment must be closely coordinated with and supported by other ground forces.

668. *Combat aviation* is a powerful weapon against mechanized forces. Bombing, chemical, and direct fire attacks will be effective under many conditions. It has the mobility and fire power to strike and break up mechanized threats before they arrive within range of artillery and antitank guns.

669. *Chemical* agents may be used to restrict possible assembly areas for armored units, to cause casualties to units in movement, and to render difficult the removal of obstructions or repair of demolitions. Ordinarily persistent chemicals will be most effective, unless their use will interfere with subsequent operation of friendly troops. Under such circumstances the use of lung irritants, tear, sneeze, or vomiting gas may be advantageous.

Improvised combustibles and explosives thrown by individuals against the most vulnerable portions of enemy armored vehicles are valuable means of supplementing close-in antimechanized defense.

670. *Mines* are an effective means of defense against ground forces. Antitank mines can be laid or buried without prohibitive expenditure of time and labor. They usually are laid in irregular order, in three or more rows, avoiding any strictly geometrical pattern. Mine fields are installed within the defended area as well as in front of it.

Mines are useful for quickly blocking defiles and favorable avenues of hostile approach. The location of mines must be coordinated with natural or artificial obstacles and with the fire of antitank guns and other weapons. They should be concealed, supplemented by dummy mine fields, and covered by fire to prevent removal by the enemy. The use of antipersonnel mines among antitank mines assist in the prevention of the removal of the mines by other than specially trained personnel.

Mine fields, contaminated areas, and obstacles restrict the movement of the troops they are designed to protect. A record must be maintained of the location and extent of such obstacles, so that friendly troops entering the area can be advised and the necessary precautions taken for the safety of troops.

Antipersonnel mines are often concealed in items of interest; consequently extreme care must be taken when examining objects left by the enemy.

671. *Natural obstacles* to mechanized attack include buildings and walls, watercourses, lakes, marshes, mountainous country, stumps, rocky ground, and thick woods. Few areas can be classed as tankproof. Undue reliance on natural obstacles must be guarded against. Guided by these considerations, the defensive possibilities of terrain must be studied constantly from the viewpoint of antimechanized defense in order to utilize existing natural obstacles to the maximum.

672. *Artificial obstacles* consist principally of mine fields, antitank ditches, obstacles, barricades and demolitions. (For details, see FM 5–30.) The location of artificial obstacles must be coordinated with natural obstacles and with the fire of antitank and other weapons. It is important that obstacles be covered by fire to prevent the enemy from removing the obstructions. Removal of obstacles can be impeded by contamination with persistent chemical agents. In general, obstacles, demolitions, mines, and persistent chemical contaminations are located where the enemy will come upon them suddenly and be unable to avoid

them. If the hostile mechanized attack succeeds in entering or breaking through the battle position, it must be stopped, thrown back, or destroyed, either by antitank gunfire, by tank-destroyer or armored units counterattacking, or by a combination of these and other available means.

673. It may be impracticable or inadvisable to direct the main effort of the counterattack against the enemy's mechanized force. A mechanized attack, once launched and initially successful, proceeds with such rapidity that an attempt to direct countermeasures against the mechanized vehicles may result in a direct pursuit rather than an attack. A counterattack against the base or flank of a salient may often be more effective than one against its point.

674. A counterattack directed at the rear of a mechanized attack will usually meet other mobile supporting troops rather than mechanized units. Such a counterattack employs all available arms, including the mechanized forces of the defender. It has the characteristics of a mechanized attack, that is, it leads with mechanized units and exploits with motorized and foot troops. It seeks to close the gap created by the hostile mechanized force and to isolate and eventually destroy the enemy's advanced elements, including his mechanized forces. However deeply these last may penetrate and however great the damage they may do, once their supply lines are cut they will be immobilized and, in the end, destroyed.

675. All available *fire support* is used in the counterattack. If the counterattack is directed against the enemy's mechanized force, this fire support should be strong in antitank cannon.

676. *Combat aviation* is used at the crisis of the action to the limit of its availability. It is employed on missions which further the attainment of the ground objectives.

677. The counterattack is conducted by units initially in reserve. The introduction of enemy mechanized forces into the situation affects the composition, location, and equipment of these reserves. They should be highly mobile and strong in mechanized and motorized elements and antitank weapons. They should be located to permit timely and rapid movement toward any point where an enemy mechanized attack may be expected.

CHAPTER 12

RETROGRADE MOVEMENTS

GENERAL

678. A retrograde movement is any movement of a command to the rear, or away from the enemy. It may be forced by the enemy or may be made voluntarily. It may be classified as a withdrawal from action, a retirement, or a delaying action.

679. Retrograde movements are made to accomplish one or more of the following purposes:

a. To disengage from battle.

b. To avoid battle in a disadvantageous situation.

c. To draw the enemy into a situation unfavorable to him.

d. To gain time without fighting a decisive engagement.

e. To conform to the movement of other troops.

f. To permit the employment of a portion of the command elsewhere.

680. Retrograde movements require constant control and supervision by all leaders. The presence of hostile armored and air forces increases the difficulties of executing these movements and necessitates the organization and occupation of rear positions prior to the retrograde movement. (See par. 646.) Prompt reorganization of units, careful attention to the feeding and care of the men, and the presence of higher commanders well forward will tend to counteract the detrimental effects of this type of action.

681. Mine fields, demolitions, obstructions, and contaminations are used to the maximum in retrograde movements to delay hostile pursuit, assist in flank protection, and to destroy abandoned matériel. Particular attention is paid to use of mines on likely avenues of approach of mechanized units.

682. *Combat aviation* is employed against hostile aviation and to delay the hostile advance or pursuit by harassing and interdicting hostile forces at critical localities. Its action will be closely coordinated with that of the ground forces.

683. In retrograde movements, maximum advantage must be taken of available motor transportation to expedite the rapid movement to the rear of units which have withdrawn from action. Security forces should consist of highly mobile units.

684. Enemy ground and air forces may be expected to follow up relentlessly both day and night any retrograde movement and to strike withdrawing columns from any direction. This necessitates continuous ground and air reconnaissance to both flanks and rear, rapid movement under cover of darkness, strong antiaircraft defense, and continuous all-around antitank defense, particularly on exposed flanks. Mobile reserves, particularly armored and antitank units, are held out in order to counteract wide and rapid movements to our flanks and rear, or penetration through our front, and to counter any attacks by airborne troops.

WITHDRAWAL FROM ACTION

685. A *withdrawal from action* is the operation of breaking off combat with a hostile force. The general purpose of the operation is to regain or preserve freedom of action of our main forces. Contact must be maintained, however, by our reconnaissance and security forces.

686. A daylight withdrawal usually involves such heavy losses and so great a degree of disorganization that it is preferable for large units to hold out at all costs until nightfall and effect the withdrawal under the cover of darkness. As a rule, only rearward echelons can be withdrawn successfully by day. Small mobile forces may execute daylight withdrawals.

687. The heavier the previous fighting and the closer the engagement with the enemy, the more difficult will be the withdrawal.

688. A withdrawal is facilitated by concealment of dispositions and movements, by bad weather, by rapidity of movement, by the careful preparation of plans, and by counterattacks. Successful counterattacks create conditions favorable to the withdrawal of hard-pressed or closely engaged units. Because of their mobility and fire power, mechanized units are especially suited to support counterattacks.

689. The commander who orders a withdrawal designates a rearward position on which the troops will prepare for a renewal of resistance or under the protection of which the troops may be assembled for further retrograde movement. The rearward position is selected at such a distance that the enemy will be compelled to regroup his forces, displace his artillery, and renew his preparations for attack. Early orders for reconnaissance of the rearward position and routes thereto are essential. The commander makes special provision for holding the road centers that control the lines of communication to the rear, and the features of the terrain that afford extended observation over the areas in rear of the battle front.

690. In a daylight withdrawal, in addition to the rearward position, the commander selects a suitable covering position and details, from any available reserves, a mobile covering force, strong in fire power, to occupy it and *cover the withdrawal of the troops engaged.* Artillery, engineers, antiaircraft automatic weapons, antitank weapons, and chemical troops are attached to the covering force as required.

691. The mission of the covering force is to stop, restrict, or divert the advance of the enemy in order to permit the main body to disengage, assemble, and move to the rear. The successful accomplishment of this mission depends largely on the composition and location of the covering force, the efficient execution of a systematic plan of artillery and machine-gun defensive fires, and the skillful use of counterattacks to release hard-pressed units.

692. The position of the covering force in a daylight withdrawal is selected so that it will cover the routes of withdrawal and the assembly position of the main body. Under certain conditions, the occupation of a flank position may be advisable in order to force the enemy to execute a time-consuming maneuver. When its mission is accomplished, the covering force withdraws to the rearward position.

693. In his order for the withdrawal the commander indicates the rear position, assigns zones or routes of withdrawal to the units of the command, prescribes the strength and conduct of the covering forces, fixes the hour and the priority of withdrawal of units, orders the establishment of essential signal communication, and takes the necessary steps to clear the routes for the movement of troops. A new command post is designated early. Prompt starting of trains to the new areas, evacuation of the wounded, removal or complete destruction of supplies and matériel, energetic measures for the maintenance of traffic control, construction of necessary bridges, and preparation for the execution of demolitions on the routes of withdrawal are of importance. Every measure must be taken to assure that no abandoned matériel or supplies are left in a condition that will permit repair and use against the withdrawing force. Adequate measures are taken for antiaircraft and antimechanized defense. Measures are instituted to regulate or silence radio communication and to insure secrecy of the movement.

694. It is best usually to withdraw the least heavily engaged units first. When the terrain is favorable and the security of the command permits it, all subordinate units may be withdrawn simultaneously. However, it usually is necessary to move certain units ahead of others in order to avoid congestion and to insure a smooth execution of the movement. This procedure also gives greater security to the command because the units remaining temporarily in place cover the withdrawal of those first to move. In some situations, counterattack may make it possible to withdraw first those units which are hardest pressed, or which are exposed to the most dangerous threats. However, when necessary to protect the command as a whole, these hard-pressed units must stay to the last. It is better to run the risk of losing certain units than to jeopardize the whole command.

695. The zone of action for the withdrawal should provide the best and most direct routes to the rear position. The movement of subordinate units is coordinated by assigning to them zones of action or definite routes. Generally, zones of action are assigned to the main combat units, especially if they may have to fight while moving back. Routes generally are assigned to trains and to those units which move to the rear under control of the higher command; such units may include artillery, tanks, and reserves. The zones of action or routes so assigned should usually extend to the rear position. If the rear position is distant, the zones or routes should be indicated back to a distance of 1 day's march.

696. At night the withdrawal of the greater part of the forces engaged commences shortly after nightfall. Small detachments are left in immediate contact with the enemy. These detachments, formed from troops nearest the enemy, screen the withdrawal by simulating normal activity of a fully garrisoned position with fire from different positions, reconnaissance by combat patrols, and use of pyrotechnics.

697. In view of the broad front upon which the detachments screening the withdrawal are employed, a single covering force commander ordinarily cannot maintain effective control. The superior commander, therefore, provides artillery support, coordinates the action of the elements holding the various sectors, indicates the time of their withdrawal, and prescribes their action in case of hostile attack. They may be directed to withdraw either at a prescribed hour or upon order. Whenever practicable, the foot elements of these detachments should be furnished motor transportation for movement to the rear, especially when the distance of the retrograde movement is great.

698. Whether the rearward position is organized for defense or is the area in which the command will be assembled for further retrograde movement, the commander makes provision for a covering force in front of this position. The mission of this covering force is to cover the withdrawal of the detachments left in close contact with the enemy and of the artillery supporting these detachments. It has the further mission of protecting the assembly of the main body for further retrograde movement or to serve as an initial outpost if the rearward position is to be defended.

699. At night the withdrawal of front line units is executed on a broad front. Troops withdraw initially straight to the rear and then move to designated assembly areas where small units are reformed and preparations are made for further rearward movement and assembly into larger units.

700. At night a part of the artillery remains in position to support the elements still in contact. It increases its fire activity to deceive the enemy as to the amount of artillery in action and assists the troops in contact in breaking off combat. Well supplied with ammunition and protected for all-around defense, this artillery sacrifices itself if necessary to insure the withdrawal of the supported elements. The remainder of the artillery is withdrawn to the rearward position, priority in movement being given to the heavier calibers.

701. During withdrawals, *antiaircraft artillery* furnishes protection for the assembly areas and critical localities along the routes of withdrawal.

702. *Cavalry* protects withdrawing troops by reconnaissance, protection of the flanks, and delaying action.

703. Continuous reconnaissance is made to facilitate the employment of antitank units and to protect withdrawing troops against mechanized attack.

704. *Tanks* are useful in daylight withdrawals, particularly in counterattacks, to assist other ground units in breaking contact with the enemy. They are not ordinarily used in night withdrawals.

705. Persistent chemicals may be used to deny or make costly the use of probable approaches. Smoke may be useful in covering the daylight withdrawal of a unit over terrain exposed to enemy fire.

706. In addition to their primary mission of effecting mine fields, road blocks, and demolitions, *engineers* reconnoiter, repair, and mark roads. In certain situations they reconnoiter and stake out rear positions and furnish guides. They assist the rearward movement of artillery, mechanized, and other units; destroy materials to be abandoned; act as part of a covering force; and constitute an emergency reserve. *Military police* furnish guides to assist the rearward movement and control traffic.

RETIREMENT

707. A *retirement* is a retrograde movement in which a force seeks to regain freedom of action, the movement being part of a well-defined plan which has for its purpose the refusal of decisive combat under the existing situation. A retirement may be made in one stage or in several stages, depending upon the distance involved. When a withdrawal from action precedes the retirement, the actual retirement begins when march columns are formed.

708. Without competent orders to do so, a *decision to retire* is justified only when all possibilities of accomplishing the assigned mission have been exhausted and a continuation of the battle will lead either to excessive losses or to a decisive defeat.

No commander is authorized to order a retirement on his own initiative simply because of local misfortune or reverses suffered by an adjacent unit.

709. In retirements following a withdrawal, the most important considerations for a commander are to place distance, obstacles, and security forces between his main body and the enemy and to regain his freedom of action.

Trains are put in march without delay, if necessary under escort, and sent to the rear to a selected bivouac area. During their retirement they establish dumps of ammunition, rations, fuel, and other supplies en route to meet the needs of the retiring troops.

Antiaircraft protection of important defiles on the route of retirement is established.

As fast as troop units arrive in assembly areas, they are formed into small columns and set in motion to the rear.

710. *Road march formations* usually are taken up when the zone of effective hostile light artillery fire is passed. Formations are modified to meet existing conditions of terrain, visibility, intensity of enemy fire, activity of enemy combat aviation, and tactical requirements for control and rapidity of movement.

711. During the initial phase of retirement made from contact, the division generally assigns specific routes to the trains, the artillery, and other auxiliary troops, and indicates when the routes will be cleared for the troops still in action. A *zone of action* usually is assigned to each combat unit comparable to an infantry regiment in size.

712. As the distance from the enemy increases, small columns are consolidated into larger columns. During the march to the rear, constant effort is made to increase the distance from the enemy. This will necessitate forced marches, night or day as well as effective security measures to protect the rear and the flanks and to delay the enemy.

713. The actual terrain objective toward which a retirement is directed depends upon the mission of the command and the purpose of the movement. It should be such as to favor the future action of the command. Factors which influence the selection of this objective are the actual and potential strength of the enemy; reinforcements that may become available; the time when the enemy can arrive at critical localities on the route of the retirement; and the extent that terrain and the weather favor hostile movement and interfere with friendly movements.

714. The formation and number of columns to be employed during retirement depend principally upon the number of roads available and the hostile interference. It generally is desirable to move the major fractions of a deployed force to the rear simultaneously and abreast of each other. However, a hostile threat to a flank may make it necessary for one fraction to hold in position until the movement of the others is well under way. A restricted road net, or defiles in the zone of movement, may necessitate withdrawals of fractions successively. If a flank is threatened during the retirement, the adoption of an echeloned formation may be appropriate.

715. The retirement order of a small command usually designates the time when each subordinate unit commences its movement. In commands the size of a division or larger, the commander usually designates the time that major portions of the command pass initial points or lines and, when appropriate, the hour that certain lines or assembly areas must be cleared. (See FM 101-5.)

716. Clearing the routes of march and organizing an effective zone of obstacles to delay the enemy's pursuing columns are of greatest importance. Engineers are sent back early to reconnoiter and improve the routes of retirement, repair bridges, and prepare obstacles and demolitions to be executed by the rear guard. Pertinent information of the location of obstacles and of the nature of the demolitions and contaminations prepared is furnished to the retiring troops. Measures are taken to prevent their endangering our own troops and to insure their execution at the proper time. Chemical troops with chemical mines may be attached to the engineers for the contamination of obstacles and demolitions.

717. *Traffic* is regulated at critical points to prevent congestion, especially in towns, at bridges, and at other defiles. Strong antiaircraft and antitank protection is established at these critical localities until they are cleared by the main body.

718. Security detachments are provided with sufficient *artillery* to support them in the execution of their missions. The remainder of the artillery is so disposed in the retiring columns as best to protect the main body or support the security detachments.

719. The *antiaircraft artillery* is disposed to protect the most vital points on the routes of the retiring columns. As the retirement progresses, the antiaircraft artillery moves rapidly by bounds from area to area, and frequently is given priority on the roads.

720. During a retirement, *cavalry* is employed on security missions, and frequently may constitute or be attached to the rear or flank guards. Reconnaissance, particularly to obtain information of any hostile movement directed toward the flanks, is important and is assigned to the cavalry or to the security detachment controlling the cavalry.

721. *Reconnaissance aviation* must keep under observation any hostile forces that are in position to interfere with the retirement, especially on the flanks.

722. *Engineers* accompany or precede the main columns to facilitate their movement. Suitable detachments are attached to rear and flank guards to assist in delaying the enemy. Some engineers may be employed in certain situations to reconnoiter and stake out rear defensive positions.

723. A retirement generally offers opportunities for the use of chemicals of all kinds. Smoke may assist security detachments in concealing their movements during successive withdrawals.

724. In retirement orders, present command posts and the next ones to be occupied should be specified. Axes of *signal communication* should be indicated as far to the rear as it is practicable to foresee them.

725. *All-around security* must be provided. In a short retirement which can be completed in one night, the covering force for the withdrawal usually gives sufficient protection for the movement. (See par. 698.) If the movement continues after daylight, a rear guard normally should be formed to protect the march of the main bodies. Initially this rear guard consists of the troops which covered the assembly of the main body reinforced by contingents of other arms as required by the situation.

726. The *mission of the rear guard* is to protect the main body from surprise, harassment, and attack. By the successful execution of this mission a rear guard covering a retirement enables the main body to avoid accepting battle, and regains for the commander of the force his freedom of action. The strength and composition of a rear guard are such as to permit the execution of its mission without the intervention of the main body. When necessary for the security of the main body, the rear guard sacrifices itself in the execution of its mission.

727. A *rear guard* covering the retirement of a combined force consists principally of infantry strong in automatic weapons, supported by artillery. Units of other arms are added in accordance with the requirements of the situation. Antitank weapons, mechanized units, signal troops, chemical troops and engineers may be included.

The ability of cavalry to conduct delaying action makes it an important element of a rear guard. When the main body has succeeded in gaining sufficient distance from the enemy, cavalry may constitute the principal element of the rear guard.

728. The formation and the method of operation of the rear guard are adapted to the situation. Movement to the rear is made by bounds, based on the progress of the main body and the time limit set by the higher commander for holding designated terrain lines. The distance between the rear guard and the main body is determined accordingly. Delays in the retirement of the main body must be expected.

729. When in contact with the enemy, the rear guard distributes its forces in groups over a wide front and opens long range fire with its artillery and other supporting weapons to force the enemy to deploy and thus to delay his advance. Unless the security of the main body requires a stubborn resistance, the rear guard, as far as practicable, avoids close range combat and withdraws successively from position to position as the enemy approaches.

The successive positions of the rear guard are chosen at such distance from each other that the enemy is forced to renew his preparations for attack in front of each of them and that changes of position by the artillery of the rear guard are reduced to a minimum. A rear guard position should favor withdrawal by affording covered routes.

730. When the enemy presses his pursuit closely, greater resistance is offered. Advantage is taken of favorable opportunities to punish overhasty pursuit by counterattack. Attack against the flanks of pursuing columns by armored troops or cavalry is an effective means of disorganizing the pursuit. *The most favorable time for offering a determined resistance is during the late hours of the day to permit withdrawal of the rear guard under cover of darkness.*

731. When the distance from the enemy permits, the rear guard retires in march formation. Its distribution corresponds, in general, to that of an advance guard, and in reverse order of march, comprising the reserve, the support, and the rear guard cavalry or motorized detachment. The support provides a rear party and necessary flank patrols. Because of the direction of march, infantry reconnaissance during the retirement is much more restricted than in case of an advance guard. Chief reliance for the execution of the necessary reconnaissances must be placed upon cavalry, mechanized units, and reconnaissance aviation. Mobile troops especially observe and forestall attempts to pass the flanks of the rear guard.

732. Advance guards, composed of mobile troops reinforced by antitank and engineer detachments, are habitually employed, not only to meet the threat of highly mobile forces but to clear the routes of march, insure the uninterrupted movement of the main body, and regulate civilian and refugee traffic. For the latter purpose military police are attached.

733. Flank security is of especial importance during a retirement. When there is danger of an encircling maneuver in pursuit, flank guards composed of mobile troops with engineer, antitank, and chemical units attached, are detailed to cover the exposed flank. When opposed by an enemy strong in armored and air forces, special attention must be paid to the security of the routes of retirement and the area or position to which the troops are retiring. Under such conditions it will normally be necessary to employ forces other than those retiring, to occupy and organize the rear position before it is reached by the retiring forces. When conditions permit, the rear position is organized behind strong natural obstacles.

DELAYING ACTION

734. Recourse to *delaying action* ordinarily implies either lack of readiness for battle or hostile superiority of force. Its purpose is to gain time while avoiding decisive action. Delaying action may be used in the opening phases of battle to gain time for the unified employment of the entire command. It also may be called for in later phases pending completion of preparations for counteroffensive action. *It finds especial application in the operations of covering forces and other security detachments.* In offensive operations, delaying action by a portion of the command to delay the arrival of hostile reinforcements may be of decisive importance.

735. Delay of an advancing enemy may be accomplished by offensive action, by defensive action in one position, by delaying action in successive positions, or by any combination of these methods.

736. Skillful use of terrain has a decided influence on all delaying operations. A series of parallel ridges across the lines of hostile advance, unfordable streams, swamps, lakes, and other obstacles on the front and flanks, high ground with good observation and good fields of fire at long range, concealed routes of withdrawal immediately behind delaying positions, and a good road net favor the execution of delaying action.

737. In situations where the enemy has freedom of maneuver and mobile troops and the flanks of a delaying force are open to hostile attack the *protection of the flanks and rear* is of vital importance. Since the enemy may succeed in pushing by the flanks or in executing a wider maneuver with mobile forces to strike in rear of an occupied delaying position, the commander must make provision to block or destroy such forces.

Ground and air reconnaissance forces must be continuously on the alert to locate such threats to flanks and rear.

738. *Delaying action in successive positions* is based on limited resistance on a position, with the intention of renewing this resistance in successive positions if necessary. The defense on each position must force the enemy to early deployment and to time-consuming preparations for battle. Combat ordinarily is broken off in each position before troops become closely engaged. The situation may, however, require a strong resistance on some position, or even a counterattack in order to accomplish the delaying mission.

The delaying measures are continued between positions in order to gain time for organizing resistance on the next position. Because of the retrograde and long-range nature of such combat, delaying action is executed most effectively by troops possessing a high degree of mobility and great fire power, especially at longer ranges.

In general, contact is made as far forward as possible and continuous light resistance is offered in order to compel the enemy to employ his whole force and to consume a maximum of time. No more ground than necessary is given up. The ability to execute planned withdrawals under conditions that permit orderly movement to the rear must, however, be retained.

739. In open terrain the important consideration in the selection of a delaying position is a good field of fire at long range. In close and wooded terrain, observation and fields of fire are equally unfavorable for both sides; the defender can, however, make full use of the cover, concealment, and obstacles offered by the terrain, whereas the attacker is restricted in movement and is unable to exploit fully his superiority of means. The ground in rear of the position should favor a covered withdrawal by screening the troops from hostile view and fire as soon as the position is vacated. Field fortifications are reduced to the minimum: full use is made of mines, obstacles, booby traps, demolitions, and chemical interdictions in front and on the flanks of the position and in the areas between successive positions.

740. The conduct of delaying action is facilitated in open terrain by selecting successive positions on high ground at such distances apart that the enemy will be forced to displace his artillery in order to attack the next position in rear. In wooded terrain the infantry bears the brunt of combat and successive positions may be much closer together. Each position should insure facilities for artillery observation and for the delivery of effective long range fire by other supporting weapons. In general, the depth of the zone of resistance is not great. The artillery and the other supporting weapons are located well forward.

741. When the enemy has superiority in air or armored forces, or both, the commander must ordinarily delay on a position until nightfall and then withdraw under cover of darkness to the rear position. Considerable distance between positions enables the commander to utilize fully the hours of darkness for withdrawal. In such situations, selection of positions strongly protected by natural obstacles which facilitate defense on a broad front becomes a primary consideration.

742. To facilitate coordination of the operations, the combat zone is subdivided into sectors, the boundaries of which are extended to the rear to include initially the first two delaying positions, and later the final position in the commander's plan of action. In favorable terrain the width of sectors in delaying action may be taken as about double those suitable for defense.

A tactical unit is assigned to each sector and is given a combat mission. The strength and composition of each unit is determined by the assigned mission, the terrain, the width of the sector, and the nature of the hostile threat. Mutual support between adjacent units is coordinated by the next higher commander.

Decentralization of operations to combat team commanders will be frequent when operating on a broad front. Continuous liaison between adjacent combat teams, and between combat teams and the higher commander, must be maintained.

743. The defense is conducted in each sector by small units holding the natural strong points of the terrain and supporting each other by flanking fire. In close terrain or during periods of low visibility, close contact between adjacent units is maintained by combat patrols. Local reserves protect the flanks of forward defense areas and cover the withdrawal of forward elements.

744. *Artillery* in general support prepares a plan of interdiction fires covering principal hostile avenues of approach and is prepared to engage distant targets. It is employed to reinforce the artillery in direct support in accordance with the requirements of the situation. Special attention will be given to interdiction of hostile movements toward the flanks and rear. *Light artillery* will often be attached to the unit it supports.

745. *Engineers* are employed to construct a barrier zone of mines, obstacles, and demolitions in front of the first delaying position and in the area between successive positions. Antitank units are attached to units covering the hostile avenues of approach. To protect an exposed flank, a mobile flank guard is detailed with engineers and antitank units attached.

746. Chemical troops may be employed to place barriers of persistent chemicals on the front and flanks of each position.

747. The *antiaircraft artillery* is employed primarily to protect the artillery, reserves, and critical defiles in rear from hostile air attack.

748. A mobile reserve, reinforced by tanks, artillery, antitank units, engineers, and chemical troops is prepared to move rapidly to counter mobile threats.

749. As in the defense of any position, an outpost, strong in automatic weapons, is deployed well in front of the delaying position to harass and delay the enemy's advance and to keep him in doubt as to its location. Artillery support for the outpost will be provided by units supporting the delaying position.

750. The greatest importance attaches to keeping the enemy in doubt as long as possible concerning the location of the successive delaying positions and the delaying nature of the operations being conducted.

751. In fighting a delaying action, some troops are disposed on the rear position to cover the withdrawal from the positions in front.

752. Timely measures are taken for reconnaissance and for preparation necessary for the occupation of the successive delaying positions in rear.

Provision is made for the establishment of wire communication from the higher commander to the sector commanders and to the senior artillery commander.

Of especial importance is efficient operation of the artillery wire net in order that the flexibility of artillery fire may be exploited to the maximum. Signal communication to distant or detached units is ordinarily limited to radio and messengers.

The wire systems of subordinate units are limited to essential lines. Full use is made of prearranged visual signals and of mounted and vehicular messengers.

753. The commander controls the operation by prescribing the time of withdrawal and the time by which each successive position is to be occupied. In open terrain, it is often better to make a timely and simultaneous withdrawal from each position. In close terrain or when a command is deployed over a wide front this may be impracticable, and the decision regarding the time of withdrawal is then left to subordinate commanders. The commander exercises control by prescribing a general terrain line to which units eventually will withdraw or in front of which the enemy will be held until a designated hour.

754. Whenever practicable, *withdrawal from a position* is effected under cover of darkness. If protracted resistance is necessary to accomplish this, measures are taken to extend the depth of the zone of resistance and to utilize to the maximum natural obstacles.

755. If the withdrawal must be made in daylight, artillery and other supporting weapons are disposed in depth. *Combat aviation and tanks* may be employed against those hostile elements which most seriously threaten the success of the operation. A daylight withdrawal may also be facilitated by organizing an intermediate delaying (covering) position to be occupied by reserves assigned to cover the withdrawal of troops in front (see par. 690). Subsequent withdrawal of the troops from the intermediate delaying position is in turn covered by other troops on the next delaying position in rear. Retirement may thus be executed by the alternate withdrawal of successive echelons from one delaying position to the next.

The loss of a defended tactical locality to the enemy does not involve necessarily an early withdrawal along the whole front. Adjacent units should take advantage of such situations to punish an impetuous enemy by heavy flanking fire and by local counterattacks whenever conditions are favorable.

CHAPTER 13

SPECIAL OPERATIONS

Section I. ATTACK OF A FORTIFIED LOCALITY

GENERAL

756. A fortified locality may comprise a single, strongly organized position. It will probably consist of a series of strongly organized positions disposed in great depth and breadth in such manner as to be mutually supporting. In either case the main position ordinarily will be composed of a series of mutually supporting major works, protected by minor gun emplacements, tank obstacles, troop emplacements, and wire entanglements disposed in front of and between them to cover dead spaces which automatic weapons cannot reach from the main fortifications.

The main battle position will be outposted by a system of concrete and steel artillery, automatic-weapon and troop emplacements, tank traps, and obstacles disposed in great depth to the front and flanks. The reduction of such a locality by direct attack may be costly in men, ammunition, and matériel. Such an attack offers little prospect of success unless the attacker has accomplished a high degree of technical training and has a great superiority, especially in tanks, engineers, infantry with special equipment, artillery, and combat aviation.

Whenever possible fortified localities are reduced by siege or by an attack from the rear, following an enveloping maneuver by ground or air-borne troops. When, because of secure flanks, isolation is impossible by an initial enveloping maneuver, and airborne troops are not available. they must be reduced by direct attack to break-through at a weak point. The break-through is followed by envelopment of the created flanks to isolate the separate parts.

757. The attack of a fortified locality may be divided generally into four phases. In application, related phases may overlap, particularly on weaker parts of the front. Immediate exploitation of the success of each phase is imperative. These phases are:

a. Reducing the hostile outpost system and gaining close contact with main position.

b. Breaking through the fortifications at the most favorable point.

c. Extending the gap by isolating and reducing hostile emplacements on its flanks.

d. Completing the action by moving mobile reserves through the gap to complete the encirclement and isolation of remaining fortifications while continuing the attack against them from the front.

Air bombardment and action of airborne troops may precede or be a part of any of the above phases. (See FM 31-50.)

758. The principal differences that distinguish a break-through of a fortified locality from the penetration (see pars. 450–454) of any other hostile position are the relatively greater special training and combat superiority required; the absolute secrecy and thoroughness of preparations; the types of special equipment and troops required; the frontage subjected to initial assault; and the action subsequent to the complete break-through and isolation of a fortified locality.

759. Air superiority is the first requirement for operations against a fortified locality.

760. Reconnaissance determines the extent of the main position and its outpost system in depth and breadth; the location of dead angles and character of emplacements, artillery and antiaircraft artillery positions, tank traps and obstacles, and observation posts; those approaches which can be covered most effectively by the hostile defenses and those which afford the greatest advantage to the attacker; and those areas in rear of the locality which favor action from the rear after a break-through has been effected. Reconnaissance involves the employment of reconnaissance and combat aviation, highly mobile ground reconnaissance units containing engineers, sound and flash ranging, and signal intelligence units. Air photographs are taken of the entire locality at successive intervals to determine the initial hostile defenses and the progress of any changes being effected therein. Important localities are outlined heavily and indicated clearly on the photographs; copies are distributed to commanders down to and including the smallest combat units which are to operate in the area covered, together with such intelligence summaries as are needed by each echelon of the command. These reconnaissances are continued throughout all phases of the operations.

761. Based on the results of reconnaissance and the task assigned, the commander determines what special troops, equipment, and combat power will be needed to break through the hostile system; he organizes his command into its tactical groupings and assigns missions to each.

The organization of the command into tactical groupings provides for self-sustaining combat units down to and including battalions, so that each echelon of attacking troops will be able to exploit local successes promptly without reference to the next higher unit, and facilitate the advance of adjacent units whose progress is not so rapid. Plans provide for the utilization of every available agency of signal communication.

762. The attacking echelon is made up of specially selected troops and weapons. Normally, this attacking echelon will contain infantry, engineers, high muzzle-velocity, flat-trajectory guns, and chemical troops. The engineers equipped with demolition equipment will destroy obstacles and mine fields, and will assist the forward movement of the infantry and direct-fire cannon. Chemical troops will lay smoke screens, fire high explosives or gas, and open lanes through contaminated ground. Searchlights may be used for illumination during night operations.

763. Training of assault detachments is carried out by having them rehearse the contemplated operation on terrain and against fortifications similar to those to be encountered. The size and number of assault detachments needed in the preliminary operations depend on the size and number of emplacements which must be reduced. Each tactical grouping must have enough trained assault detachments with sufficient special equipment to insure the reduction of all emplacements in its zone of action.

764. Sufficient reserves are disposed in concealment behind the attack echelon to insure success and to meet hostile reaction. Sufficient artillery of all calibers required to reduce the outpost system supports the attack echelon. Artillery of the heavier types assists the preliminary operations by constant bombardment of the hostile main position, paying particular attention to hostile artillery which can bring fire upon troops engaged in preliminary operations.

The use of combat aviation employing heavy bombs is important. Combat aviation is coördinated with the action of the attacking echelon. Hostile elements defending the intervals between emplacements must be neutralized or destroyed.

765. Movement to attack positions is accomplished under cover of darkness, fog, or smoke.

766. All forces not required in the preliminary operations are held concealed beyond the range of hostile artillery, and continue training and preparations required for the attack against the main fortifications.

767. The advance through the hostile position is a step-by-step process, determined by the progress of the assault detachments. It must be rapid enough to prevent the enemy from reestablishing the continuity of his front by recoordinating his fires or by counterattack.

768. Fire of heavy artillery is directed upon emplacements, massive obstacles, mine fields, and wire entanglements. The fire of lighter, flat-trajectory weapons and of flamethrowers is directed against loopholes in emplacements to neutralize the hostile weapons. Flat-trajectory artillery with high muzzle velocity, using direct laying, is employed to penetrate emplacements and armored turrets. Air bombardment may be arranged through coordination with the air commander and air attack employed against those positions of the fortified zone which offer profitable targets.

The assault detachments, screened by smoke and taking advantage of accidents of terrain and dead spaces outside the angles of fire, push through and around emplacements under protection of the fire of all available supporting weapons and other troops in the attack echelon. The assault detachments are protected by fires and smoke placed on other localities from which hostile reaction may interrupt their movement. especially flank positions and troop emplacements not being attacked.

Engineers and other troops destroy remaining obstacles, mine fields, wire entanglements, tank traps and other obstacles which may impede the advance. They prepare crossings necessary for the supporting armored vehicles and weapons.

769. Some emplacements will remain intact following the employment of heavy artillery and combat aviation. Members of the assault team are assigned to destroy these emplacements by the placing of demolition charges. Under cover of supporting fires and smoke, the assault detachment advances close to the emplacements; final selection is made of the exact location and route thereto for each demolition to be placed; and the preparation of each demolition is completed. Nonpersistent chemicals, smoke, and incendiaries may also be thrown through the loopholes. Scaling ladders may be necessary in placing demolitions.

770. When all is in readiness for the assault, signal is given for supporting fires to lift. When supporting fires are lifted, troops detailed to place the demolitions rush forward immediately, cut or blow lanes through any remaining wire, and place and arm their demolitions under protection of smoke and direct fire on adjacent emplacements, then take cover. When the demolitions open the way into the emplacement, the assault troops rush the position and overpower hostile personnel remaining active. Hand grenades, thermite bombs, and light demolitions complete the destruction of bays not neutralized by the first demolitions.

771. Ordinarily, one assault detachment is formed for each emplacement to be attacked. After the capture of an emplacement, the next emplacement scheduled to be attacked is overcome in the same manner. When an assault results in prolonged hand-to-hand fighting, local supports are rushed forward to assist the assault detachment. Each assault detachment is provided with reserves and local supports who follow up the advance closely, disposed for rapid passage through the detachment in the event the attack results in serious disorganization. Any halt is dangerous because of speed with which a local hostile counterattack can be organized and launched, supported by weapons which are already in position and highly coordinated. Small isolated resistances which have been passed over are reduced by special mopping-up detachments from general supports and reserves.

772. During the assault, supporting fires are concentrated on those hostile targets which constitute the greatest danger to the success of the assault and a renewal of the advance; special attention is directed toward locating and bringing prompt bombardment or fire to bear on any hostile mechanized and local reserve elements forming for counterattack. When the advance is resumed, supporting fires conform to the movements and needs during the advance to the next emplacements.

773. During the advance to the next emplacements, units are reorganized as completely as time and facilities will permit; any additional personnel, equipment, and material needed against the next emplacements are sent forward. Necessary adjustments in groupings, of plans of maneuver, and of plans of fire are affected.

774. The speed and regularity of the advance through the outpost system depends in a large measure on the degree of coordination maintained by the commander after the assault of the first emplacements.

Effective signal communication is vital. Liaison between tanks, artillery, the attacking troops, and aviation is maintained by all possible means of signal communication including radio telephone in the clear. Liaison officers, extensive wire nets, messengers, airplanes, relay runner stations, visual signal stations, and advance message centers are employed in ample numbers to insure timely transmission of information and orders.

Once the operation is initiated, a failure of signal communication must not result in the halt of a tactical grouping whose advance is still possible. When a commander knows the plan of advance through the position and his unit is making progress, he halts in the absence of orders only when he *knows* that his continued progress will endanger unduly the plan of his superior commander.

THE BREAK-THROUGH

775. While the preliminary operations are in progress, preparation for the penetration of the main fortifications is continued. New air photographs of the position and intelligence summaries are issued as necessary. All equipment, weapons, assault detachments, and other troops to be employed are in readiness to move forward to positions under cover of darkness, fog, or smoke by the time the preliminary operations are completed.

776. The main position will be composed ordinarily of a series of mutually supporting major works, protected by minor gun emplacements, tank obstacles, troop emplacements, and wire entanglements disposed in front of and between them to cover dead spaces which automatic weapons cannot reach from the main fortifications. The front of initial penetration of the position is carefully selected; it will be determined frequently by the existence of terrain and roads which favor the employment of armored forces in the break-through and exploitation. The dead angles within and between the main fortifications are sought out with particular attention to covered approaches thereto.

777. The width of the front of penetration is limited by the amount and types of artillery and aviation available, the capabilities for tank ar armored force employment, and the number of trained assault detachments available with proper equipment.

778. Airborne troops may be landed within and in rear of the larger fortifications on the front of the main attack, to block the movement of reserves and to assist the assault troops by attacking the fortifications from the rear. If they are used in the main fortified position, arrangements must be made to lift all artillery fire just prior to their arrival on the position.

779. The amount of ammunition, artillery, and bombardment aviation available, the degree of surprise possible, and the depth of the fortifications on the front of the penetration will determine the length and intensity of preparatory fires prior to the assault. In any event, bombardment of the whole front by artillery and aviation continues from the opening of the preliminary operations. At some time prior to the hour of attack, the bulk of all supporting fires, ground and air, is concentrated on the fortifications on the front of the initial penetration. Combat aviation attacks hostile reserves, artillery, and sensitive points in the fortifications which artillery cannot or does not reach. Heavy and medium artillery is concentrated on points in the fortifications which offer the greatest danger to success of the penetration. The fire of flat-trajectory weapons is directed against lighter obstacles and loopholes in the fortifications. Smoke is used extensively to screen the front of attack.

780. Preparation fires on the front of penetration are lifted on a time schedule or on signal from the commander of the composite unit, depending on orders from higher authority. The bulk of the preparation fires then shifts to the next fortifications to be reduced or is placed to meet hostile reaction to the initial assault. Fires are maintained against fortifications not subjected to assault.

781. Once a breach has been effected and the emplacements on the initial front reduced, additional assault detachments are sent into the gap at once to attack the flanking works in each direction and widen the base of the penetration while the composite unit deepens the penetration by advancing and attacking the next fortifications in its zone. Troops in rear of the composite unit are pushed rapidly through the gap created.

782. Because of the location of the flanking fortifications and troops within or nearby, the enemy is able to organize and launch a strong counterattack with great rapidity. Delay in attacking the flanking fortifications and reinforcing the advance of the composite unit may result in a serious reverse and the loss of the composite unit by hostile counterattack. Troops confronting the flanking works move to the support of the assault detachments as rapidly as fortifications are neutralized.

By breaking the continuity of the enemy front, the coordination of his mutually supporting fires is broken. His extensive signal communication system permits the enemy to reestablish rapidly the continuity and coordination of fires covering his front. Hence, once a breach has been effected its immediate exploitation is imperative.

783. The operations are continued until the entire front selected for a major break-through is reduced. As the attack progresses, the flanks of the penetration are defended against hostile counterattacks and the passage through the gap of troops assigned to exploitation and rear-attack missions is protected.

784. Only a commander who is actually present at a point of crisis can exercise a direct influence upon the attack echelon. A division or lower commander must be well forward from the time the attack is launched until a complete break-through is effected.

During the attack, much of the coordination originally ordered will fail because of the fluctuating fortunes on the front of attack. This condition will become more pronounced as the gap is widened and the penetration deepened. The initiative, vigor, and boldness of subordinates must be allowed full play. (See pars. 128 and 189.)

785. When the fortified locality has been breached throughout its depth, highly mobile units are immediately pushed through the gap under the protection of troops holding the shoulders of the penetration, of troops landed by air in rear of the fortifications, and of combat aviation. Mechanized forces lead the way. Once through the gap, mechanized forces spread out fanwise, moving rapidly on all roads leading toward the hostile rear and toward the rear of fortifications not reduced, to disrupt hostile lines of communication, destroy signal communication, to block the movement of reserves, and to complete the demoralization of the enemy. Closest cooperation by and coordination with aviation is demanded. The principal targets for bombardment aviation are hostile reserves, signal communication installations, and isolated resistances attempting to block the movement of the exploitation forces. Following the lead of the mechanized forces, the remaining troops of other arms in the exploiting force move rapidly to complete the isolation of the remaining fortifications and assist in the complete destruction of the hostile field forces. Since it must be expected that the enemy will attempt to close the gap, suitable forces must be assigned the mission of keeping it open.

Section II. OPERATIONS AT RIVER LINES

GENERAL

786. Owing to the restrictions which they impose upon movement and maneuver, wide and unfordable rivers exercise considerable influence on military operations. They constitute obstacles to an attack and natural lines of resistance for defensive and delaying action. They assist in screening against hostile ground reconnaissance and in providing security against hostile mechanized attack.

The attack across unfordable rivers requires *special preparations*, both technical and tactical, proportionate to the size of the river and the relative strength of the opposing forces.

787. *Reconnaissance* of a river line is essential both in attack and defense. The strength of a river line increases with the width and depth of the river and the velocity of the current. Other considerations with a tactical and technical bearing are the banks, the topography of the adjacent terrain, islands, and tributaries, the river bottom, the approaches to the river bank, the practicability of fords, and the danger to be expected from ice floes and freshets.

788. *Coordination with combat aviation* is essential in all large offensive operations at river lines. Local air superiority is gained and maintained during the operation. River crossings can sometimes be greatly facilitated by use of airborne troops.

ATTACK TO FORCE CROSSINGS

789. The defenses of a river line sometimes can be outflanked. By demonstrations (strong in artillery and air activity) carried out at various points on the river line, an attempt is made to deceive the enemy as to the projected point of crossing, while a strong mobile force makes an unopposed crossing elsewhere and launches an attack to envelop the hostile flank before the enemy can readjust his dispositions.

When the enemy is not actually holding a river line, an effort is made to anticipate him in the possession of the necessary crossings. Mobile forces are advanced quickly on a broad front to seize the desired crossings and to occupy the dominating terrain on the far side in order to protect the crossing of the main body.

790. Troops transported by air and mechanized and motorized units may be employed to seize and hold important crossings until the arrival of leading elements of the main forces.

791. When the enemy is already in possession of a river line which cannot be turned, the crossing must be forced. Under favorable conditions, a river crossing may be forced by rapid and audacious methods. This may be accomplished by a bold attack by troops transported by air and by mobile ground forces strong in armored vehicles, bridge equipage, storm boats, and amphibious vehicles. In the absence of such favorable conditions, a more deliberate operation is required. Hostile troops are driven promptly across the river, and systematic preparations to force a crossing are initiated.

792. In an operation involving the crossing of a river, the actual crossing is a means, not the end sought. The immediate purpose is to get across quickly and economically and establish a bridgehead which will protect the crossing of the remainder of the command.

In establishing a bridgehead for a large force there are usually three successive objectives on the enemy side of the river: first, a position which will eliminate effective, direct, small-arms fire from the crossing front;

second, a position which will eliminate ground-observed artillery fire from the selected ponton bridge site(s) and which can be supported by light artillery on the attacker's side of the river; third, a position which will eliminate all artillery fire from the bridge site(s) and will provide the necessary maneuver space on the enemy side of the river for the command. Attainment of the first objective facilitates the crossing of succeeding troops by assault boats, foot bridges, and troop and vehicle ferries. Attainment of the second objective, coupled with air supremacy, normally will make possible the construction of ponton bridges to cross the bulk of heavier loads. Attainment of the third objective, coupled with air supremacy, gives uninterrupted use of crossing means over the river, permits the protected maneuver of troops in furtherance of their mission, and facilitates the accumulation of supplies on the enemy side of the river. The assignment of river crossing objectives or missions to units must allow sufficient freedom to subordinate commanders so that successes can be fully exploited.

793. *Reconnaissance* of river lines across the routes of advance is begun by staff and engineer officers at an early stage of the operation. Air photographs showing the nature of the river and the bridge destructions effected by the enemy enable the commander to make an early estimate of the possibilities of crossing and the means required. Ground reconnaissance of the river line can be executed ordinarily only after hostile covering forces on the near side of the river have been driven across the river.

Reconnaissance provides detailed information and furnishes the basis for the selection of the crossing points and the execution of the necessary preparatory measures. Based on the results of reconnaissances and on the tactical situation, decision is made regarding the front or fronts on which the crossing will be forced.

794. In general the attacker should operate *on a wide front* with several determined attacks at separated localities. Secrecy in preparation and deception of the enemy as to the time and place of the main crossing are essential. Feints, deceptive use of smoke, or demonstrations are employed to deceive the enemy. (See par. 797.)

795. In the selection of crossing fronts and the crossing points, both tactical and technical requirements are considered.

Tactically, the attacker seeks concealment for his movement to the river, concealed final assembly areas, a long stretch of river bordered by trees or low hills, undefended crossing points, and good avenues for advance, especially roads, on the enemy side of the river. Dominating ground on the attacker's side of the river favors artillery observation and support of the attack by overhead fire. A salient in the river line toward the attacker favors concentration of combat power and flanking fire on enemy troops defending the salient. While the attacker of this type of salient can rest his flanks on the river after crossing, he may be forced to attack on a narrow front to break through a strong defense at the base of the salient.

Technically, the attacker seeks a moderate current, a water area unobstructed by islands, bars, and reefs, suitable shores, good approaches on both banks, and easy connection to the existing road net. Old bridge sites frequently are advantageous.

796. Having selected the front or fronts on which the crossing is to be made the higher commander formulates his *plan of action* for the crossing.

797. Tactical groupings are assigned to each crossing front and are given instructions regarding time of crossing, objectives, zones of action, assistance to adjacent units, and type and location of bridges to be constructed. Other troops may also be assigned to make feints or demonstrations at points other than the main crossing fronts so as to deceive the defenders and to draw them away from the main crossing fronts. A portion of the command is held in reserve to exploit the most successful crossing.

798. *Engineer troops and matériel* must be made available early in the planning stage of the operation so that reconnaissances can be made and equipment prepared and properly disposed. Nondivisional engineer troops with the necessary ferrying matériel normally are attached to the leading combat teams making the crossing on each front. In addition, a reserve of engineer troops and matériel must be provided to erect bridges or to assemble raft ferries, to reinforce the means of crossing at decisive points, to replace losses, and to do other engineer work such as maintenance and extension of the road net.

799. The *unit engineer* of the senior echelon is charged with all technical preparatory measures for the crossing and for the distribution of engineer troops and matériel, the construction and guarding of bridges, and the regulation of traffic thereon.

The location of *engineer matériel* prior to the crossing (particularly ponton bridge equipment) must be carefully concealed. Discovery of its presence may disclose the plans of the commander to the enemy. It forms a remunerative target for hostile airplanes and artillery and should be given antiaircraft defense.

The command post of the unit engineer is connected by signal communication troops with the command posts of the superior commander and the commanders on each crossing front.

800. As soon as a tactical group is assigned to a crossing front, its commander and the commanders of troops supporting the crossing on that front direct staff and subordinate officers to reconnoiter the ground over which they will operate, to locate routes of approach, final assembly areas, actual crossing points and routes thereto, and to prepare plans for schedule fires and other details of the crossing operation. In the execution of reconnaissance. restrictions imposed in the interest of secrecy must be observed.

Signal officers reconnoiter the front of crossing for existing wire lines on the near side of the river and determine the need for additional wire lines. They also determine the possibilities of the extension of these lines on the far side. Prior to the crossing radio communication is prohibited or reduced to the minimum in order to preserve secrecy. Once the crossing has been initiated. radio usually is relied upon for communicating with units across the river until telephones lines are established.

801. When the necessary preparations have been made, the superior commander gives the order for the execution of the crossing. (See FM 101–5.)

802. The hour of crossing is determined by the superior commander. It is more difficult to load and cross boats during darkness than during daylight. This difficulty may be more than offset by the security and secrecy afforded by darkness.

803. Shortly preceding the crossing, the bulk of the troops to make the crossing is placed secretly in concealed bivouac out of hostile artillery range but within easy night marching distance of their crossing fronts. A minimum of artillery may occupy concealed positions and fire for registration. For purposes of secrecy all artillery may be silenced. Only covering forces and the necessary reconnaissance parties are permitted to approach the river. Covering forces along the river are designated from troops other than those to make the initial crossing.

804. Ordinarily all supporting troops go into position under cover of darkness on the night of the crossing. Leading assault units move to final assembly areas where they are met by engineer troops with assault boats, footbridge, or other crossing means.

Final assembly areas have the following characteristics: accessible for trucks which bring up engineer matériel, defilade, easy identification, concealment from air and ground observation, and several direct and concealed routes to the crossing points.

805. The first assault waves on each front, led by engineer guides, carry their boats from the final assembly areas to the water's edge and launch them on a broad front. Lateral movements and the massing of troops at the river bank are avoided. Measures are taken to regulate traffic and to suppress noise during the movement to the river. Ropes strung across the river will facilitate the crossing and provide additional safety to personnel.

Departures from the final assembly areas are timed to permit leading units to cross simultaneously on a broad front, but once these units leave the final assembly areas they do not halt and no attempt is made to maintain alinement between boats. Normally, there is no firing from the boats when the crossing is made under cover of darkness.

The movement from final assembly areas to the far shore is under control of the engineer troops.

806. The engineer crews return the assault boats to the near shore for the second wave, which has moved from its forward assembly area. If the current is swift, allowance for drift must be made in fixing time or place of meeting the boats. If boats are to be reused, allowance must be made for probable losses during the crossing of the first wave. It may be necessary for succeding waves to carry additional boats, or for engineers to furnish individual ponton boats or raft ferries to carry these waves.

807. *Footbridges* may be used for crossing first waves over narrow streams. Their construction is difficult under smallarms fire. Ordinarily they are used to cross succeeding waves of foot troops, particularly after the first objective has been attained.

808. *Ponton raft ferries* are provided to cross vehicles which will be needed before it is practicable to build the ponton bridge. Ferry construction usually is practicable after the first objective has been seized. Ponton raft ferries often are continued in use after the bridge is built to serve as an alternate-crossing means and to handle return traffic.

809. *Alternate plans* are prepared for exploiting success on any crossing front by assigning troops from other fronts or from the general reserve to cross on the front where the crossing has been most successful.

810. In addition to the fires of organic weapons, the crossing of tactical groupings is supported by artillery, combat aviation, smoke, and the fires of supporting weapons of the general reserve.

811. Supporting fire may be opened several hours prior to the initial crossing against an enemy prepared to resist in a well-organized position, or may be withheld until after the crossing is discovered, in order to obtain surprise.

812. The *artillery* gives close and continuous support to the advance. As soon as the assault waves advance from their first objective, the artillery begins displacement of individual batteries across the river. Later the mass of the artillery is advanced, the displacement conducted in such a manner as to assure continuity of artillery support. Artillery observers and liaison groups, with the necessary means of signal communication, accompany the assault units during the crossing and advance to the objectives.

813. *Antiaircraft defense,* both by ground units and aviation, is centered around the crossing fronts and particularly the ponton bridges. A portion of the automatic weapons of the antiaircraft defense is crossed to the far bank by boat or ferry before construction of the bridges is started. Continuous protection for the bridges is maintained as long as required.

814. *Smoke* can conceal river crossing operations from ground observation but ordinarily not from air observation. It frequently is used during daylight hours in connection with feints or demonstrations in addition to concealing the actual crossing of the initial waves. The use of smoke places additional importance on the marking of embarkation points and bridge sites and the routes leading thereto.

815. The first objective having been taken and supporting infantry units having been brought up behind the initial wave, the attack is continued without delay on the second objective. Since this objective is selected in order to deprive the defender of his ground observation of the river, considerable resistance may be expected. Aggressively used, mechanized units may be effectively employed at this time.

816. The second objective having been taken, or the hostile light artillery neutralized, the superior commander normally directs the construction of the ponton bridge (or bridges). The greater the number of bridges made available, the quicker and surer is the crossing. The construction of bridges from local materials requires much time and labor. Quicker results are obtained from the use of ponton equipment.

Alternate bridge sites are selected in advance. Transferring operations to an alternate site after the equipment is unloaded at the first site is a time-consuming and difficult operation. Decision for such a move rests with the superior commander.

317. The bridge having been completed, the remainder of the artillery and other troops are crossed and a coordinated attack, if necessary, is made on the third objective. If construction of a bridge should prove impracticable, the passage of all troops and equipment is by ferry. When the third objective has been attained. subsequent operations may be of an offensive or defensive nature as the situation may demand.

318. Control during the crossing and advance to the first objective is mainly a responsibility of the leaders of small units. Capture of the first objective gives an opportunity for the next higher commanders to resume control and direct the attack on the second objective. Since the capture of the second objective usually is followed by the construction of ponton bridges and the crossing of artillery and the remainder of the troops, the superior commander may direct a coordinated attack on the third objective. The period of delay on each objective is as brief as possible. Every effort is made to conduct operations in such a way that the third objective will be seized and held in the minimum period of time. Signal communication is maintained initially by radio between forces on the opposite sides of the river. Later, wire lines may be laid across the river and wire communication established between the principal command posts.

319. Armored divisions, cavalry divisions, and other *mobile units* effect river crossings by advancing rapidly and bodly to seize the necessary crossings and bridgeheads on the enemy's side of the river. If this is impossible, they effect wide detours to weakly defended or undefended points on the river and then cross. If all crossings are destroyed, horse cavalry units may swim and armored or mechanized units may be ferried until bridges can be constructed.

DEFENSE AGAINST CROSSINGS

820. An unfordable river may be employed as an obstacle in front of a defensive or delaying position, or as an aid to defensive-offensive action which seeks to strike the enemy while his forces are astride the river. A river line loses much of its value as an obstacle if the enemy is not forced to make a direct attack; it becomes an obstacle to our own troops if successful counteroffensive action is to be followed by an exploitation.

Holding a river line in such force as to leave available insufficient reserves destroys the flexibility of the defense and exposes it to immediate defeat as soon as the river line has been pierced.

821. The commander must insure the complete destruction of all bridges and fords, which cross the river within his sector, to prevent them from falling intact into the hands of the enemy. The actual destruction is usually a mission of the unit engineer. Unless specifically forbidden by higher authority, any bridge or ford may be destroyed. When it is considered desirable to preserve such crossings until the last possible moment, full authority to complete their destruction is delegated to any member of the bridge or ford guard. When it is apparent that the crossing cannot be kept from falling into enemy hands, *it must be destroyed.*

822. A river may be used as an obstacle directly in front of the battle position. In such a case (see sec. II, ch. 11) the river bank positions are held in strength; adequate reserves are provided to intervene at decisive areas. Such a defense is possible only when large forces are available on the front to be held and the enemy is unable to turn or avoid the position. It subjects the troops in forward areas to the full force of the enemy artillery preparation.

Emplacements are so located that the opposite bank and its approaches are held under fire and the enemy's attempts to cross are frustrated in their beginning. Salients in the river line and open terrain dominated by the enemy are lightly held but are capable of being covered by the concentrated fire of weapons.

The *artillery* is employed as in the defense of a position, except that a part may be placed well forward to cover the most likely crossing places, the enemy's probable assembly positions, and avenues of approach. The artillery must be prepared to concentrate its fire against the main crossing when it is discovered.

Tanks are held in reserve to be employed against those hostile elements which have gained a foothold on the friendly side of the river and constitute the greatest threat of the integrity of the position.

823. River lines may be defended by defensive-offenive action. (See sec. IV, ch. 10.) Unless the situation and the strength of the available forces indicate the advisability of holding the river line in strength, it is best usually to hold the mass of the forces in readiness at such distance to the rear that it can intervene promptly at any point where a crossing in force may be attempted. The river line then is held by relatively weak detachments. Stronger detachments with local reserves are posted at the most probable points of crossing. The operations of the advanced detachments are organized in accordance with the doctrines governing outposts. It is their mission to force the enemy to disclose the full power of the supporting fires, to discover hostile crossings, and to prevent hostile troops from establishing themselves in bridgehead positions before the arrival and attack by the general reserves.

824. In defensive-offensive action, some artillery may be attached to the outpost detachments. The mass of the artillery is held in readiness prepared to support the attack. Then it is emplaced so that it can concentrate its fire in the critical area and support the attack in the decisive direction. Since the mass of the hostile artillery will still be on the far side of the river, much importance attaches to the neutralization of hostile air and ground observation regulating the enemy's artillery fire.

825. In defensive-offensive action, the attack of the general reserves is made as soon as the hostile main crossing is recognized. The plan for this action is prepared beforehand. Success depends upon the commander's ability to launch the attack at the proper time and in a decisive direction. It must be launched before the enemy has established himself in a bridgehead position. To this end, efficient signal communication must be assured and reserves must be prepared to move promptly and rapidly.

The mobility of the troops held in reserve is increased by the assignment of motor transportation.

Decisive results are promised by the prompt employment of mechanized units and combat aviation against hostile units which have already crossed the river and by air attack of bridges and of troops engaged in ferrying operations.

826. In any defense of a river line, covering forces remain on the enemy's side of the river to maintain contact with the enemy, delay his advance, and determine his assembly positions and probable crossing places. When forced to retire, these advance elements withdraw across the river. Timely measures are taken to destroy the crossings after the last elements have withdrawn across the river, or at such earlier time as may be necessary to prevent the crossings from being seized by the enemy. On wide rivers, after the covering force has withdrawn, contact with the enemy may be maintained by use of patrol boats.

827. The primary missions of the engineers are to destroy fords, bridges, and matériel which may assist the enemy in crossing; to reconnoiter the terrain along the river: to assist in organizing the ground: and to keep the roads in condition for rapid movement of reserves. Engineers also block with obstacles and mines the hostile avenues of approach to the river, embarking points, and landing points. Floating mines, rafts, and fireboats may be prepared and held in readiness upstream. Preparations are made for illuminating the water area at night.

828. *Combat aviation* can operate to prevent ferrying or bridging operations of the enemy by first achieving air superiority and then operating directly against ferrying and bridging equipment before it reaches the river, against ferrying and bridging operations and against troops assembled for crossing.

829. *Signal communication* is established so as to insure rapid communication with the outpost and covering forces and the quick transmission of orders to the reserve and the artillery. Multiple wire circuits are laid along alternate routes to increase the probability that some of them may escape damage from the heavy fire anticipated.

830. *Cavalry* units are employed initially on reconnaissance or security missions on the enemy's side of the river. Later they protect the flanks of units on the river or are held in mobile reserve.

The principal mission of the *antiaircraft artillery* is to protect the reserves and the artillery. Preparations are made to reinforce rapidly the antiaircraft defense in critical areas.

831. In a retrograde movement when the river line is to be held as a defensive or delaying position, the retiring columns cross at the available bridges which are not under hostile artillery fire. If the crossing places are insufficient, the construction of additional bridges or ferries may be necessary. Antiaircraft defense is established on both banks of the river line to protect the bridges and crossing places.

Trains, motorized columns, and a part of the artillery cross first. Routes leading to and from the bridge approaches and crossing places are plainly marked. Staff officers with detailed instructions for march sequence and future action direct units to their destinations. Traffic is regulated strictly during the retirement across the river. Bridges and fords are destroyed to prevent them from being seized by the enemy and arrangements are made to ferry the last elements of the covering forces.

As soon as it has moved across the river, the artillery which crossed early is placed in position to protect the crossing places and cover the retirement of the remainder of the command. This echelon later is reinforced by the remainder of the artillery after it has crossed the river. At the earliest practicable moment, a plan of artillery defensive fires is prepared which will take advantage of the long range and flexibility of artillery fire to lay down interdiction and counterpreparation fires on the hostile routes of advance and assembly positions.

832. The river may lie in rear of a defensive position. This is equivalent to defending a bridgehead and the position selected should eliminate all enemy artillery fire from the bridge sites and provide the necessary maneuver space. An even greater distance from the river may be desirable in order to find suitable terrain and to allow space for retrograde movements during the conduct of the defense. Plans must be made for withdrawal across the river.

Section III. NIGHT COMBAT

833. In spite of the inherent difficulties of the operation, night attack has assumed major importance as employed by troops especially trained to overcome the difficulties of the operation and exploit its advantages.

834. *Night combat* is characterized by a decrease in the effectiveness of aimed fire and by a corresponding increase in the importance of close combat and the fire of fixed weapons laid on definite targets or areas by day; by difficulty in movement, troop leading, and the maintenance of direction, cohesion and signal communication; and by a more highly sensitive morale of the troops.

Decrease in the effectiveness of fire permits the use of closer formations without exposure to excessive losses; difficulty in the maintenance of control and direction necessitates limited objectives which may be approached by well-defined routes; the more sensitive morale of the troops increases the effects of surprise obtained by the offense and the importance of security measures on the part of the defense.

Fog or smoke produces conditions of combat similar to darkness. Because of the uncertain duration of a fog and the amount of ammunition required to establish and maintain smoke concentrations, operations based on concealment provided by fog or smoke require rapid execution.

835. An unexpected collision of troops at night, or combat which extends into the night, usually develops into a standing fire fight and a suspension of movement. As a rule, night combat can be conducted successfully only when there is time for the preparation and distribution of a well-conceived plan and for thorough reconnaissance by all leaders during daylight.

836. In night combat, the influence of unit commanders on their troops is greatly diminished. Tactical operations and troop leading are surrounded with greater difficulties; the uncertainties of combat exercise a greater influence than in daylight operations.

837. Night attacks are made to complete or exploit a success, to gain important terrain for further operations, to avoid heavy losses which would be incurred by attacks in daylight over open terrain, or to attract hostile reserves.

838. Simplicity of plan, careful preparation, secrecy, surprise, and cohesion in execution are prerequisites to a successful night attack.

839. *Surprise* is the most essential feature of night attack. Preparations for night combat, whether made during daylight or darkness, must avoid betraying the locations or intentions of the troops. The attack itself may be made by stealth or by full use of all available fire power. Tracers tend to demoralize the defender.

840. The difficulties of night attacks increase with the size of the command. They therefore usually are undertaken only on a limited scale and with limited objectives.

841. Night attacks are made preferably by fresh troops or by reserves of troops in contact with the enemy. The best available troops should be used. When made by troops already in contact with the enemy, many details of execution are left to the commanders of front-line units.

Night attacks are often the manifestation of an aggressive leadership, which is determined to bring about a conclusion without delay. Morale of the troops and quality of the leadership, especially in the lower grades, rather than numbers, are likely to measure the success attained.

When fresh troops are designated to make a night attack, their approach march is protected by troops already in contact with the enemy.

842. The hour at which a night attack is to be made depends upon the object sought. The exact hour of attack is kept secret as long as possible.

An attack launched during the first hours of darkness frequently strikes the enemy before he has had time to organize his position or his artillery support. It may also anticipate possible night operations on the part of the enemy. It may be delivered after victorious combat in order to frustrate the enemy's attempts to organize a withdrawal at nightfall or to consolidate a position for defense.

An attack during the last hours of darkness may be advantageous as a preliminary operation to a general attack at daybreak because it gives the defender no time to reorganize. The attack should usually be launched to give the attacker three hours of darkness on the objective in which to organize the position to resist counterattack. Antitank guns are brought up and emplaced. Tanks are moved forward and made immediately available to assist in repulsing the counterattack.

843. The decision to attack should be made while there still is sufficient daylight to make all preliminary reconnaissances and preparations. Reconnaissance should include observation of the terrain at dusk, so that both the day and night aspects may be studied. Easily identified direction points are located and provision is made for guides.

844. Subordinate commanders are carefully instructed concerning the terrain, the objective, and the direction of attack. Routes of approach are carefully marked, guides are provided, and compass directions are given.

845. Orders for night attacks are formulated with more than usual detail. Routes of approach, assembly positions, line of departure, and objectives are designated with the utmost exactness. Orders include the rate of advance; the formations to be employed; means for mutual identification of troops; measures for flank protection and for maintenance of direction and contact; the composition, initial position and mission of the reserve; the course of action to be followed in case of success; the signal for withdrawal in case of failure, and a rallying point for each subordinate unit in case of withdrawal. Precise and detailed instructions for maintaining secrecy are issued: the use of lights is forbidden; bayonets are fixed; vehicles and animals are left at assembly positions and other measures to insure silence and secrecy are prescribed. The time of attack may be included in the order or may be announced later.

846. In the conduct of night attacks, only the simplest formations are employed. If the attack is to be made by stealth, the smaller units advance in column until close to their objectives, when skirmish lines are formed and the enemy is rushed with the bayonet without firing. Each column is given a definite direction and objective. Contact is maintained between columns and every precaution is taken to avoid their collision. The assaulting columns are followed closely by their supports and local reserves. The supporting weapons of the attacking force may be placed in position for flank protection of the initial assault. When the terrain is favorable for overhead fire, they may be emplaced in a rearward position to support the attack on signal or to cover a withdrawal. The advance to the objective is so timed as to permit close support of the assaulting troops at daybreak. General reserves are held generally well in rear and preferably on a flank, prepared to move promptly to the objective or to cover a withdrawal.

847. The particular circumstances attending each situation usually will indicate whether the assault should be prepared by artillery fire. Where artillery support is indicated, a short but violent preparation generally will suffice. This preparation is lifted on a time schedule. The artillery holds itself in readiness to intervene promptly and energetically in accordance with a prepared plan of fire to box off the zone of attack or to cover a withdrawal. The artillery neutralizes located hostile artillery.

848. On capturing their objectives, units are reorganized and promptly disposed to meet a counterattack. Their further conduct is prescribed in the attack orders.

849. In night combat, the defense has the advantages of better knowledge of the terrain and of organized defensive fires covering the principal avenues of hostile approach.

850. Vigilant outguards, active patrolling well to the front, and illumination of the foreground must be relied upon to give timely warning of attacks. Gaps that cannot be covered effectively by fire from adjacent units are occupied at night by elements in support. When a hostile attack is suspected or known to be in progress, supports and local reserves are brought closer to the main line of resistance.

851. Obstacles and the fire of fixed weapons are the principal means used in breaking up the assault. Small-arms fire is opened as soon as the alarm is given and combat outposts have been withdrawn. Local supports and reserves, using the bayonet only, counterattack, preferably the enemy's flanks.

852. Night raids may be used to capture personnel. obtain identifications and determine details of the hostile position, and especially any major changes in the enemy dispositions.

When a raiding force has accomplished its mission, it withdraws on a previously arranged signal. A route of withdrawal other than that employed for the advance is used if practicable. During the withdrawal, the reserve of the raiding force is utilized to cover the withdrawal and to protect its more vulnerable flank. Fires of the artillery and other supporting weapons are employed to neutralize the enemy advance elements and supporting weapons. The artillery neutralizes located hostile artillery.

853. As a rule, delaying action at night can be executed only by small units or detachments which operate and retire along well-defined routes. Rearward movements are regulated carefully to avoid losses by fire from friendly troops in rear. When the enemy possesses great superiority in combat aviation, daylight maneuver of large units may be impracticable. Disorganization and delay of advancing hostile ground columns may be accomplished by the night attack of small groups against marching columns, bivouacs, billets, or motor parks.

Section IV. COMBAT IN TOWNS

854. Towns offer concealment for troops and weapons and protection from fire of weapons and mechanized attack. Consequently, they are often naturally strong defensive areas. On the other hand, they are conspicuous topographical features of which exact details are either available or readily obtainable. Fires started by hostile incendiary ammunition may make towns untenable.

855. Combat within the limits of a town is characterized by reduced effectiveness of fire and observation, by increased importance of close combat, and by difficulty in control of troops. Fighting is at close range, and the outcome depends largely upon the initiative and aggressive leadership of subordinate commanders.

856. A town strongly held by the enemy may be taken by fixing the garrison through a holding attack while so directing the main attack as to isolate the town from the support of neighboring defensive positions. When immediate capture of the town is essential, the main attack is directed against the flank or rear of the town in order to secure the advantages of enveloping attack. When frontal attack cannot be avoided, the attacker concentrates on the capture of the near edge of the town by the methods applicable to the attack of any organized position and then reorganizes his effort to continue the advance through the town. The action within the town necessarily is decentralized to subordinate infantry leaders since lack of observation of the action precludes satisfactory centralized control. The attack is pushed rapidly through the town to capture quickly the exits on the far side. Assault units are freed from the responsibility of mopping up the town.

857. The larger the town and the longer it has been held by the enemy, the more thorough must be the preparations for attack. Visual and photographic reconnaissances determine the defensive organization of the area and the nature of defensive works and furnish pertinent data to all elements participating in the attack.

858. When the enemy has organized the town into a strongly fortified position which cannot be avoided or outflanked, the advance may have to be made frontally, strongly supported by artillery and other supporting weapons, and aided by combat aviation. When the fire of the supporting artillery and other supporting weapons is lifted, the assault echelon pushes through the defensive area in a series of bounds; supports and reserves mop up and organize the area for defense against hostile counterattack. The attack is continued through the town to the far side in a similar manner. Strongly defended towns rarely present opportunities for tanks to exploit their mobility due to the restrictions of barricades, debris, streets, cellars, and short range antitank methods. However, opportunities will present themselves frequently where the support of tanks in such situations becomes desirable.

859. In organizing a town for defense, defense areas are established. Fields of fire are cleared and the defensive capabilities of the town are developed by the laying of extensive mine fields and barricades, strongly protected by the fire of automatic weapons, mortars, antitank guns and artillery. Antipersonnel mines and booby traps should be used liberally throughout the barricades. The conception of defense should be one of thorough all-around defensive preparation, with outlying buildings utilized for position organization to form salients from which the front or flanks of the town can be covered by flanking fire. Reserve units should be located within the town so as to facilitate movement to threatened areas.

860. Security detachments are posted at all important public service installations, such as water reservoirs, pumping stations, or electric power plants, in order to protect these installations from damage by small hostile groups or individuals who are able to penetrate the defense of the town.

861. The outer defense is supplemented by defensive organization in depth throughout the area of the town. Obstacles are constructed and bridges are mined to prevent penetration of hostile armored elements. Buildings and cellars are fortified as firing positions to cover favorable avenues of approach, from all directions within the town.

862. To prevent the bypassing or isolation of the town and its eventual capture by hostile forces, through cutting off all supplies from the rear, a strong mechanized reserve is held outside the town in concealed positions, prepared to break up the enemy's outflanking maneuver.

863. Towns are favorable to *delaying action,* as they keep the attacker in ignorance of the strength of the forces confronting him and provide concealment and cover for screening the withdrawal. (See FM 31–50.)

Section V. COMBAT IN WOODS

864. In many respects, combat in woods is similar to that in towns (sec. IV). Often, in combat in woods, observation and control of troops are even more difficult than in towns. Some woods, owing to their size or location, are naturally strong defensive areas. Other woods, however, may have little or no defensive value, and may even be advantageous to the attacker by providing concealed routes of approach into the defensive position. Small woods are avoided as they are clearly marked and draw fire.

865. The *attack* usually seeks to avoid isolated wooded areas included in the enemy's defensive position by passing them on either or both flanks while neutralizing their edges by fire or smoke. The artillery blinds the enemy's observation by smoke and neutralizes the hostile weapons that are capable of delivering flanking fire against the attack. During dry weather incendiary bombs are highly effective. Small wooded areas may be neutralized with chemicals.

866. If avoiding the woods is impracticable and their possession is necessary, the attacker seeks to capture the woods by enveloping action. When enveloping action is inexpedient, the woods are attacked frontally. The attack is directed first against the salients which are neutralized by the fire of the artillery and other supporting weapons. This supporting fire is maintained until the assault echelon is ready to rush the salients, when it is lifted to the reentrants of the woods, or to suitable targets within or on the far side of the woods.

The near edge of the woods is carried like any other position and then is used as a line of departure for the advance through the woods. The dispositions to be taken for this second phase of the attack depend largely upon the character of the woods. In sparse woods, formations are employed resembling those on open ground, but with greater density in the leading echelon. In dense woods, small columns are more effective in the leading echelon. Measures are taken to insure direction, cohesion, and signal communication between the columns. Supports are formed in column and closely follow the assault units. The vulnerability of the flanks to attack requires special measures for their protection.

867. All commanders must be watchful to prevent combat groups from assembling on or near roads and trails since these will be covered by the enemy's system of defensive fires. The enemy's strong points are outflanked by an advance straight through the woods off the roads and trails. To avoid confusion and to prevent friendly troops from firing into each other, it may be necessary to regulate the advance by bounds. Reserves are disposed so that they will not become involved in the fighting of the assault echelon and can be engaged where the greatest progress is being made.

868. Before debouching from the woods and while still far enough from the edge to be concealed from the enemy's view, the command is disposed for fighting on open ground. and arrangements are made for support by the artillery and other supporting weapons. As the edge of the woods presents a well-marked target for hostile fire, the attacking forces make their egress rapidly to seize an immediate objective beyond the edge of the woods. Whenever possible, this objective should mask the edge of the woods from hostile ground observation and small-arms fire.

869. The movement of combat vehicles is regulated so as not to block the routes of advance through the woods. If the woods are not too extensive, vehicles are held on the near side until the attacking echelon has reached the far side.

870. As a defensive position. woods have the objection of presenting a clearly defined target to the attacking forces. Since a position in the interior of the woods has the disadvantage of restricted view and limited field of fire, the observation elements of the outpost are advanced close to the edge of the woods. The routes forward and to all positions in rear are reconnoitered and made known to all concerned.

While holding up the attacking units by means of obstacles, the *defense* seeks to break up the cohesion of the attacker's dispositions. lead him into false directions, and take the attacking troops under flanking fire. Natural or cleared lanes through the woods assist greatly in the development of flanking machine-gun fire and in detecting and holding up a hostile advance. Supports and local reserves are posted with a view to counterattack against the enemy's flanks. Full advantage is taken of the opportunities for ambush. surprise. and counterattack.

In wooded areas, close support by artillery becomes difficult. Fields of fire of all flat-trajectory weapons are extremely limited. The fire of high-angle weapons is not equally affected; a little clearing will permit howitzers and mortars to be used.

871. When there is a possibility that the enemy may launch his attack on either side of a wooded area, preparations are made to repel the hostile groups with flanking fire from the flanks and salients. Combat groups are located in the area outside the woods to oppose the enemy's outflanking maneuver. Tanks held concealed in the woods, with routes reconnoitered and prepared, will add power to the counterattack of the defender.

872. When close contact is imminent, bayonets are fixed and preparations made to engage the enemy with rifle and machine-gun fire and to meet him in hand-to-hand combat with hand grenades and the bayonet.

Section VI. MOUNTAIN OPERATIONS

GENERAL

873. Mountainous terrain not classified as alpine offers no insuperable obstacles to the conduct of military operations, even in cold weather, if troops are properly equipped, clothed, supplied, and trained. In general, mobility is retarded, movement is restricted, firepower and fire effect are reduced, and signal communication and supply are more difficult.

874. Mountain warfare is characterized primarily by difficulties which terrain offers to movement. The inaccessibility of certain regions restricts areas in which troops are able to operate. The restricted nature of certain areas such as narrow valleys and defiles limits the strength of forces which can be maintained and moved therein. The inadequate road net found in sparsely settled mountains enhances the military value of existing roads, adds importance to heights which dominate them, and slows down the operations.

Key terrain features consist of heights which dominate valleys and lines of communication with observation and fire; passes which permit movement through mountains; and roads and railroads which must be secured for supply purposes.

875. In mountain combat the commander is limited by terrain as to the means which he may employ. Success depends more upon proper adaptation of available means to the terrain than upon their power. Maneuver of small units and the initiative and leadership of subordinate commanders are of the highest importance in mountain warfare. They are favored by the concealment which is available for movement, by the diminished effect of firepower resulting from defilade, and by facilities for observation. The plan of maneuver for the force as a whole is more closely subject to considerations of terrain than in ordinary regions. The problem often resolves itself into a matter of striking hostile routes of communication and of defending one's own routes. The actions of small semi-independent units in seizing or defending heights which dominate lines of communication or of fighting to seize or block passes and other defiles on routes of communication become of increased importance.

876. When formulating plans for operations, possibility of sudden changes in weather must be considered. Arrangements are made for frequent periodic weather reports. Meteorological equipment with personnel to operate it is desirable. Alternate plans are prepared to provide for changed weather conditions.

877. The theater in which the forces are to operate will necessitate special equipment and special training to fit the climate, the character of the terrain, and the type of hostile forces to be encountered. They should ordinarily have a preponderance of high-angle, fire-supporting weapons; a high percentage of pack transportation; an adequate amount of radio and visual signal communication; and a high degree of logistical self-containment. Necessary specialized training includes ability to maneuver adequately on skis and snowshoes, visual signaling, use of both pack and motor transportation, mountain climbing, use of the gas mask in rarefied atmosphere and marksmanship. Physical hardening is a prime essential. Mountain operations call for the ability to carry heavy loads in long marches over rough trails.

878. Decentralization of operations is characteristic of mountain warfare. Tactical groups usually operate semi-independently in the capture of terrain objectives in order to carry out the plan for the force as a whole.

879. *Infantry* is called upon frequently to operate without close support of artillery. Specially trained and specially equipped infantry is best suited for combat role in mountainous terrain. Infantry units must be sufficient in fire power and capable of carrying on extensive operations without the aid of supporting arms and services. Since infantry operations in mountainous terrain are more fatiguing than in ordinary terrain, specially qualified and specially conditioned troops are necessary to carry out successfully the combat mission.

Machine-gun units seldom find fields of fire which permit them to utilize full grazing effect. The sharp relief offers opportunities to support advancing infantry with overhead fire. Mortars and grenades attain increased importance due to the increased amount of defilade.

880. *Cavalry* may include both mechanized reconnaissance and horse elements. The importance of horse elements increases in wooded, mountainous terrain, while the role of mechanized elements decreases. While mechanized units may be used on distant reconnaissance missions to the front and flanks or as flank protection, they are highly vulnerable to ambush. Horse elements are employed on similar less distant missions; some are attached to tactical groups for reconnaissance and security purposes.

881. The howitzer is best adapted for *artillery support* in mountainous terrain. Ordinarily flat-trajectory cannon can be used only at long ranges because of the necessity of clearing masks and reaching objectives defiladed by steep slopes. Horse-drawn and motorized artillery units are emplaced near the roads; pack artillery is capable of following foot and mounted elements and taking defiladed positions in the more difficult terrain overlooking the valleys. Control of artillery is decentralized.

Because of the difficulties in the conduct of artillery fire with air observation, greater dependence is placed on ground observation in mountainous terrain. Observation posts must be reconnoitered and established early and provision made for liaison observers with the forward echelons to assure close and timely support. Artillery liaison observers of the forward echelon must receive the same specialized training as mountain infantry.

The effectiveness of counterbattery is diminished because of the difficulty of locating hostile batteries. The effectiveness of interdiction fires is increased because of the number of definite points which the enemy is compelled to pass.

882. The importance of engineers increases with the difficulties of the terrain. Maintenance of existing roads and construction of new roads are of primary importance. The existence of numerous sensitive points on the few highways facilitates demolition. The difficulties of access to certain positions frequently necessitate use of aerial tramways in a stabilized position. The rocky soil requires employment of explosives for constructing even the simplest of entrenchments. Light portable bridging equipment is necessary in mountain operations.

883. The hazards of flying in mountainous regions place a great restriction on the use of low-flying combat aviation. The restricted road net often offers a favorable opportunity for combat aviation to attack critical road junctions and troops in defiles. Combat aviation may be effectively employed against hostile artillery positions and reserves on the reverse slopes. Occasions may arise for employment of airborne troops. Such occasions include seizure of an important distant defile, and quick movement of a force to operate against the hostile flanks or rear.

884. Armored units suffer so many restrictions in mountainous terrain that their effective employment is generally very limited.

885. *Antitank* units are especially effective in the mountains as their weapons are easily placed and hidden.

886. The operations of the *signal units* are affected by the scarcity of commercial wire lines, by difficulties of laying wire, by "dead spaces" in radio reception, and by terrain barriers between adjacent corridors in which troops are operating. Dead spaces in radio reception may be obviated by relaying messages. Additional radios are desirable. Great reliance is placed on visual signaling and messengers. Messenger dogs may be used to supplement foot messengers.

The command post of a small unit usually is located near the observation-post of the unit. Command posts of regiments and larger units should be near road centers and, if practicable, near a landing field.

RECONNAISSANCE

887. *Reconnaissance* in mountain warfare is facilitated by the restriction of enemy movements to the available road net and by numerous defiles, but it is made difficult by changing weather conditions, rugged terrain, and the concealment and cover available for hostile troops. The apparent impassability of certain areas must not lead to the conclusion that they are inaccessible to hostile troops.

Maps of mountainous regions seldom are accurate A correct knowledge of the terrain can be gained only by a study of the ground itself, supplemented by a study of air photographs. The employment of reliable local guides may be advantageous.

Mechanized reconnaissance vehicles are pushed out for distant reconnaissance; however, absence of alternate routes and suitable turn-arounds offers them little opportunity for escape when surprised and ambushed Horse cavalry patrols can utilize trails for reconnaissance purposes.

Ground observation is unusually important in mountain operations. Some observation posts offer very distant views and afford opportunity for extended lateral observation. Observation is subject to sudden blinding due to atmospheric changes. Observation posts are echeloned in altitude as well as in width and depth.

Offensive reconnaissance executed by specially trained detachments, operating in difficult areas which often are weakly guarded, will produce excellent results. The capabilities for reconnaissance and counterreconnaissance by small elements operating with boldness should not be overlooked.

Close reconnaissance is conducted by dismounted patrols equipped with radio and visual means of signal communication. It is initiated early and pushed well to the front. It is tedious and fatiguing, but may be facilitated considerably by use of local guides. Aviation will be the principal means of obtaining information of hostile dispositions, installations, and troop movements in rear areas.

MARCHES

888. All available roads and trails are used for movement. Since displacements within tactical groups or columns are difficult during the march, the march order of units must be such as will facilitate their entry into action.

889. The rate of march in mountains is influenced by the elevation above sea level, steepness of slopes, and other factors. The rate of marching and the rate of climbing of well-seasoned troops is not greatly affected by changes in elevation of less than 5,000 feet above the altitude to which they are accustomed; greater increases in altitude cause sharp reductions in marching and climbing rates. In elevations above 5,000 feet conservation of energy becomes of prime importance. Pace must be slower; short rest periods are important during the first hour of marching.

The total time required in marching and climbing under favorable conditions on fair roads and trails is approximately the time required for marching the map distance plus 1 hour for each 1,000 feet of ascent.

When frequent steep slopes are encountered, greater distances between foot or animal elements are required. Rests depend upon the mission, the length and difficulty of the march, and the condition of the troops. On long marches, frequent short rests may be taken in addition to the customary regular halts. At a distance from the enemy, effort is made to utilize favorable routes in valleys in order to reduce fatigue of troops. Motors and air transport sometimes may be used for rapid displacement of reserves.

In *winter,* travel may be possible only for specially equipped and specially trained foot troops, as support artillery and pack trains may be completely immobilized. In such cases combat aviation may be an effective substitute for artillery, and transport aviation or man pack may be the only means of supplying marching columns.

890. *Security on the march* calls for special measures due to the distant observation which may be available to the enemy, slowness of movement, increased possibilities of surprise by ambush, and terrain restrictions on the movement of flank security detachments. Tactical groups usually will march separated by terrain obstacles which deprive them of mutual support. Establishment of all-around security for each tactical group is necessary.

Special measures which afford security in mountains include movement by bounds of the main body and the advance guard; seizure of the opposite and the lateral crests previous to the entry of a column into a valley; dispatch of detachments, including airborne troops, to seize critical points of the terrain to assist the advance through or egress from the mountains; utilization of darkness and fog; utilization of defilade in the area subject to hostile observation and fire; employment of rear guards even during an advance; and employment of combat aviation.

Because of the difficult routes followed by flank security detachments and the fatiguing nature of their operations, it is usually necessary to provide relieving detachments at lateral or branch valleys. Consideration must be given to the fact that such detachments should start one to two hours ahead of the main body and ordinarily are unable to rejoin their units until after the completion of the march.

891. When contact becomes imminent, advance guards, exploring all routes in their zones of action, endeavor to seize terrain objectives which will cover the deployment of the main bodies. Because of slowness of movement of troops developing for combat, advance guards will act independently for longer periods of time than is the case on more normal terrain.

892. It is difficult to obtain *security at the halt* with a continuous screen of outposts. A more effective method is to send out detachments to occupy heights in the principal directions from which the enemy might fire on the main force. It is advantageous to send small groups well out to occupy dominant observation posts and defiles in order to discover the advance of the enemy from afar and thus gain information of the enemy's strength in time for it to be of use. The mountainous terrain enables these detachments to effect greater delay than in normal terrain.

The interior guard of all camps and bivouacs is arranged with special care. Enemy detachments may infiltrate through security dispositions in areas which are difficult to guard and succeed in making deep incursions into a bivouac area.

OFFENSIVE COMBAT

893. In *attack,* action of the force as a whole usually will be along an axis of advance. Tactical groups fight under the almost complete discretion of their respective commanders. Their operations are aimed at key terrain features in their zones of advance which either are objectives in themselves or which must be passed in reaching assigned objectives. (For attack of defiles, see sec. VIII.)

In difficult mountain terrain, the reinforced battalion is ordinarily the largest unit which can be employed as a unit in the attack

894. Because of the importance of lines of communication, objectives are usually terrain features such as passes or heights which control hostile lines of communication or from which the enemy can dominate friendly lines of communication by observation and fire.

895. The commander influences the action by deciding at the outset where he intends making the main attack. Usually it will be the terrain feature which offers the best opportunities for flanking action by small units, effective supporting fires, and the most advantageous approach to a decisive objective. Adjacent tactical groups make secondary attacks. The commander disposes his reserves primarily to favor reinforcement of the main attack. When the terrain permits, reserves are so located as to be able to exploit the success of secondary attacks.

896. Surprise is facilitated by the exceptional defilade and dead space which the mountains afford and which frequently permit a debouchment at a short distance from the enemy. Surprise is completed by action of small detachments operating in areas which are difficult to traverse and appearing on the flanks or in the rear of the hostile position. The possibilities of employing airborne troops for this purpose should be considered.

897. *Boundaries* between tactical units usually are not designated. Instead, subordinate units are given axes of advance to their objectives, particularly when they operate at extended distances from each other.

898. Each tactical group makes its main effort along the crests and slopes or by a combined advance along heights and valleys. It is particularly important that early possession of the heights on each side of the defile assure protection to troops operating within the defile.

Infantry units advance by bounds, employing infiltration and enveloping action. They seek to outflank and capture hostile strong points on successive spurs and ridges. Supporting weapons of both infantry and artillery direct their fire to neutralize the enemy s observation and strong points. Artillery with each tactical group furnishes close support.

Combat aviation may be employed against hostile artillery reserves and supply installations.

899. The flanks of tactical groups are protected by terrain obstacles supplemented by the action of detachments acting either as flank guards or as liaison detachments with adjacent combat teams.

900. In addition to the possibilities of surprise which they offer, night attacks present special advantages. They avoid losses which would be incurred by attacks in daylight across ground that is slow and difficult for the advance with insufficient supporting fires and carried out under observed fires of the defense. The sharpness of relief lines facilitates maintenance of direction in the night attack. (See sec. III.)

901. The success of each tactical group is exploited to the utmost by *pursuit*. When the location of the reserves and the terrain permit, each tactical group is reinforced. It pushes rapidly and deeply in the designated direction and initiates lateral movement against hostile forces which are holding up adjacent tactical groups whenever conformation of the terrain permits. It is this lateral action against the lines of communication of the enemy which will cause withdrawal of the enemy to become general and change the action from exploitation of a local success by one tactical group to a pursuit by the whole force.

In addition to direct pressure exerted on the withdrawing enemy, every effort is made to delay his retreat by combat aviation and to block him by the action of encircling forces to secure terrain objectives which bar the hostile avenues of retreat. Encircling maneuvers may be difficult to organize because of lack of mobility. However, small detachments of foot troops relieved of all excess equipment may be used; airborne troops may be used; and at times small detachments of cavalry may be able to effect the encircling maneuver. In deep snow, ski troops may be employed effectively. Key terrain features on the enemy's route of withdrawal may be suitable objectives for airborne troops.

DEFENSIVE OPERATIONS

902. In *defensive operations,* dispositions are based on the mission, on the routes of advance open to the enemy, and on the possibilities offered by a combination of difficult terrain and fire effect for breaking up the hostile attack. The defense seeks to retain heights which dominate, by observation and fire, hostile routes of communication and approach. It also seeks to deny the enemy access to passes or other defiles which, if lost, will render defended heights untenable.

903. *Defensive positions* usually comprise a combination of heights and defiles. In defending heights, positions forward of crests are difficult to screen from hostile observation. Steepness of the slopes and the defilade caused by sharp relief may make the establishment of bands of fire with flat-trajectory weapons impossible. On the other hand, positions on forward slopes lend themselves to long-range barrage and interdiction fires by flat-trajectory weapons and for a long-range observation system. Reverse slopes may afford a good field of fire for automatic weapons against personnel clearing the crest. It often is possible to combine the advantages of forward slopes, crests, and reverse slopes. If the forward slope is too steep, the depth of the position may be increased by utilizing spurs extending toward the front to establish advanced elements of the position which are capable of flanking fires. At times two successive crests can be included in the position.

In defending passes or defiles, the defense attempts to support its flanks on impassable obstacles on adjacent heights. It takes full advantage of observation from the slopes of these heights, and pushes the flanks of the position forward on them in order to gain reciprocal flanking fires in front of the position. For other methods applicable to the defense of defiles, see section VIII of this chapter.

904. *Demolitions and chemical agents* assume increased importance to the defense. In favorable terrain such as passes and other defiles, contaminated demolitions are capable of blocking the advance of all arms except infantry detachments without vehicles. Their effect may endure for long periods of time.

905. The *outpost* of a defensive position usually has good routes of withdrawal which unmask fires from the battle position. Security elements are pushed out in front of the outpost position with the missions of gaining contact with the enemy at the greatest possible distance and of gathering information which will assist the commander in disposing the elements of his command, particularly in locating his reserves advantageously.

It is important to delay the enemy as far in front of the position as possible. The more difficult the prospect of the defense of the battle position, the more important becomes this delay.

906. The main battle position will include defensive areas which may be considered as almost impregnable, due to difficulties of approach combined with a continuous system of fires, and areas which are more vulnerable to attack due to the difficulty of covering them with a continuous system of fires. Extreme care must be exercised in concluding that certain terrain is impassible for the attacker since areas that actually are impassible for specialized detachments are rare. The dispositions should achieve continuity of fires throughout those areas which permit, and at least continuous surveillance over those sectors in which dead spaces render a continuous system of fire impracticable. Organization in depth is designed to prevent any deep penetration of the more vulnerable sectors.

The limited road net imposes rigidity on defensive dispositions. Once made, they are difficult to change and their proper determination constitutes one of the basic decisions of the commander.

Ambushes and a complete system of protected road blocks should form an integral part of the defense.

Reserves are held close to main routes of lateral and axial communication.

907. The battle position consists of defense areas organized for all-around defense and occupying important terrain features. Gaps between adjacent defense areas are closed by connecting groups strong in automatic weapons and are covered by other defense areas on dominating terrain in rear.

908. The distant observation available to the defense offers opportunities for long-range interdiction fires by both artillery and other supporting weapons. Such fires complement planned demolitions and must be coordinated with them.

Counterpreparation fires may be applied in mountains with unusual effect since careful study of the terrain will indicate almost conclusively areas in which the enemy will form for attack.

Combat aviation is particularly effective in preventing or delaying the maneuver of hostile reserves, particularly in their passage of defiles.

909. From the beginning of the action, the defense must plan to maintain the integrity of its position by local counterattacks in case the enemy penetrates between adjacent defense areas. These counterattacks are prearranged as to direction, objective, and supporting fire so that they can be launched on short notice when the enemy is exhausted and spent in his attack. Because of the local nature of combat, a general counterattack is seldom possible. The reserves will ordinarily be held well forward.

910. The rear areas of a defensive position may be subjected to harassing attacks by specialized enemy detachments able to traverse terrain which is impracticable for larger forces, or by airborne troops. Protection from such attacks is afforded by placing security elements in positions which command areas in which hostile approach is at all probable. The security elements charged with this duty should consist of light detachments able not only to drive off the hostile forces but to pursue them and cut off their retreat.

911. In *delaying action,* the usual operation is to slow down the enemy by maintaining on high ground elements which threaten by fire any hostile movement along the valleys. This is combined with a series of resistances in defiles with special emphasis on blocking passes between valleys.

912. The commander prescribes axes of withdrawal for tactical groups and successive positions which they are to reach as well as times of arrival on each.

The breaking off of combat by small units is facilitated by sharp relief which affords them dead space from hostile fire.

Engineer and chemical units are utilized to effect delay by demolitions and by chemicals in areas which have been coordinated with interdiction fires of artillery.

Section VII. COMBAT IN SNOW AND EXTREME COLD

GENERAL

913. Military operations conducted under conditions of extreme cold and deep snow demand special equipment, and, preferably, special organization and training for troops designated for such operations. Severe weather conditions handicap movement and require special tactical and logistical measures for successful operation.

914. The role of *infantry* remains unchanged. Movement in deep snow is difficult and slow unless special equipment has been provided and units have been trained thoroughly in its use.

Foot troops trained in the use of skis, snowshoes, and other special equipment can operate under conditions which immobilize other troops. In deep snow, the movement of mounted and motorized units is very difficult. For operations to be conducted during extreme winter weather, the infantry component of the force should be large.

The infantry units are organized into light self-sustained combat teams from which all weapons and equipment, unsuited to the operation, have been removed.

915. *Ski troops* are especially equipped and trained for operations on skis in deep snow. Ski troops are especially well suited for use as patrols or as raiding parties against the hostile flanks, rear, and lines of communication. In extensive winter operations, large bodies of ski troops may operate as a major force. Armament is adapted to the operations to be undertaken. In general, armament includes rifles, bayonets, a large proportion of light automatic weapons, pistols, hand grenades, and material for destroying trains and mechanized vehicles. Heavy weapons transported on sleds may be included, but when high mobility is essential these weapons usually are undesirable.

916. *Horse cavalry* can be effectively employed in cold climates with little snow. Deep snow will impair its mobility.

917. *Armored units* move across country with facility when the ground is thoroughly frozen and there is little snow. Streams and other bodies of water present no barrier when frozen to a sufficient thickness to carry the weight of vehicles. Vehicles of the track-laying type can operate in snow which is packed sufficiently to provide traction. For the successful operation of motor-powered vehicles in extreme cold special equipment for starting and operating engines must be provided.

918. Extreme cold affects both ballistics and matériel of *field artillery*. Snow affects mobility. It may be necessary to replace trucks by tractors, and to place matériel on runners. Horse-drawn and pack artillery are suitable in cold climates with little snow.

919. While the missions of the air forces remain unchanged under conditions of extreme cold and deep snow, these conditions reduce the capacity of all air units to participate in air operations.

In many situations, detached forces can be established or reinforced by airborne troops, and essential supplies, such as food, ammunition, and gasoline, can be delivered to ground troops by air transport.

920. The principal mission of *engineers* is the maintenance of open lines of communication. Engineers may be augmented by additional enlisted men or by civilian labor, and by special snow removing equipment. Organization for this task approximates that of any well-organized highway department. Engineers may be called upon to assist in the construction of trenches in frozen ground where the use of explosives is required.

921. Full use is made of existing commercial signal installations. Radio is extremely important and the number of sets is increased. Shelter for operators and equipment is essential. In deep snow, messenger service is by ski messenger or by sled.

922. *Chemical agents* which are liquid or which vaporize at low temperatures will be useful in operations of this character. Screening smokes are relatively unaffected by temperature. Agents disseminated by means of thermal generators are unaffected by temperature.

923. When planning tactical operations for execution during rigorous winter weather, careful consideration must be given to the probable effects of weather upon operations, health of troops, supply, evacuation, and maintenance of signal communication. Ice, deep snow, and extreme cold modify the normal utilization of terrain features, and present unusual problems which must be solved to insure success without unnecessary casualties. Provision must be made, in particular, for the supply of warm clothing and bedding of special types suitable to the requirements imposed by the climate. Provision must be made for hot meals and for an adequate supply of water.

924. In deep snow and extreme cold distant reconnaissance is performed by air units and is subject to the conditions imposed by bad weather and short periods of daylight. In deep snow, close reconnaissance is best performed by ski patrols. When the terrain is favorable, this reconnaissance can be deepened by the use of motorized sleds which are employed either independently of or in conjunction with ski patrols. Mechanized and motorized units and horse cavalry are effective when the ground is frozen and there is little snow.

925. Marches in snow and extreme cold are executed on foot, mounted on horses, on skis, on snowshoes, by motor transport, or by a combination of these methods. With the exception of ski troops, the distance covered ordinarily will be less than that expected under more favorable climatic conditions.

926. The principal problem for foot or mounted troops in snow is that of breaking the trail. Troops marching in front are relieved frequently. The trail may be broken by men on skis, by horse-drawn sleds, by tractors, by tanks, by snow plows, or by horse cavalry.

927. If 1 foot, or more, of suitable snow is present, trained skiers, in open terrain, are the most mobile troops. The rate depending on the slope of the ground, varies from about 1½ to 3½ miles an hour. For short distances with trained men it will reach 6 miles an hour. Under unfavorable conditions, skiing is very exhausting and the usual system of halts will not apply. The number and length of halts must be determined by the conditions encountered.

928. The rate of movement on snowshoes varies from

1½ miles to 2½ miles per hour. Marches over considerable distances can be performed only by men trained and accustomed to the use of snowshoes.

929. The possibility of movement by motor transport is dependent on the depth of snow. In 3 inches or less, motor transport without special equipment can move at reduced speeds. In snow up to 18 inches deep, motor transport can move if equipped with chains, and leading trucks equipped with lugs. In snow over 18 inches deep, a snow plow is necessary. When shuttling is contemplated, adequate provision is made for cleared turn-arounds. Tractors and half-track vehicles will experience little difficulty in any snow that is sufficiently packed to give traction. Motorcycles are of little value in any snow.

930. *Security* is facilitated by the limitations which snow and ice impose upon the movement of large enemy forces. Unfavorable weather may limit air and ground observation of the enemy, but requires special security measures against raids by ski troops.

931. Where snow impedes movement, security forces of troops on the march ordinarily consist of ski detachments, operating as patrols.

932. Security at a halt is affected by the fact that enemy movements in heavy snow, except for units on skis, are limited to roads. This indicates the need for strong detachments posted on roads, with the areas between them covered by dismounted or ski patrols. The tour of duty of sentinels, under severe conditions, may be for periods as short as 20 minutes.

933. Dense forests provide an effective screen against hostile air observation for elements not utilizing roads or beaten trails. In open snow-covered areas, protection against observation is increased by use of a white covering for clothing and equipment. Since the operations of ground troops, not specially equipped, are restricted in heavy snow to cleared roads, targets for attack by enemy aircraft are often presented. Therefore, the employment of all effective antiaircraft measures is necessary. Because the movement of large-caliber guns is often difficult, active defense may be limited necessarily to the extensive use of light automatic weapons.

934. Two important factors affect measures for antimechanized security. First, extreme cold decreases the importance of water obstacles; however, concentrated artillery fire, air bombing, or deliberately placed demolition charges may make them either an obstacle or a trap or both. Second, snow over 18 inches deep will limit or completely stop the use of wheeled combat vehicles, except on cleared roads, and will hamper the operation of track vehicles. In snow, antitank guns should preferably be mounted on runners and drawn by light tractors. Snow trenches, revetted on the near side, are effective obstacles when frozen. On roads in hilly country, heavy boulders are effective.

Antitank mines, unless properly placed, are relatively ineffective as the tank will press them deeper into the snow without exploding them. They should be placed on a hard surface if satisfactory results are to be expected. The low volatility of gasoline at low temperatures reduces the effectiveness of the gasoline grenade against tanks. If used, they should be thrown at both the top and bottom of the tank.

Snow increases the opportunities for employing antipersonnel mines and booby traps, especially along trails.

935. Many chemical agents which are effective at normal temperatures are not effective in extreme cold. This is particularly true of persistent agents. However, protective measures must not be neglected.

936. *Offensive operations* require special preparations, proportionate to the strength of the command and the climatic conditions. Signal communications, supply, and evacuations become increasingly difficult as the attack progresses. Careful planning and detailed preparations are essential in order to insure that the attack does not fail through lack of adequate command and administrative arrangements.

When formulating plans, the possibility of sudden weather changes must be considered and preparations made to meet the difficulties imposed by such changes. Additional heavy snow may fall during the operation, thus further restricting movement and mobility. A sudden thaw may prevent cross country movement or cause troops to become cut off from adjacent friendly forces. Fogs may develop quickly, and low clouds may obscure observation. Special arrangements are made for the compilation of frequent weather reports. The plan of operations having been decided upon, it is executed promptly, being adapted to changes in weather as they occur.

937. An *envelopment* by a properly equipped force offers many prospects of success. Deep snow will hinder the movement of hostile reserves, other than ski troops, to meet the envelopment.

938. If practicable, the main attack is made over ground free of heavy forests and snow drifts. Wooded terrain areas are preferable to stream valleys which ordinarily contain deep drifts. However, it is expected that ridge lines may frequently offer better avenues of approach than corridors because the wind often sweeps the crest clear and allows more rapid movement.

939. The objectives of the attack are the critical terrain features which dominate the roads leading from the hostile position. Seizure of such features will prevent withdrawal, reinforcement, or resupply, and will result in the eventual surrender or annihilation of the enemy.

940. *Combat aviation* targets remain unchanged under conditions of extreme cold or deep snow.

941. The use of *armored forces* in the attack is dependent upon favorable terrain, which must be free of heavy forests and deep snowdrifts. When snow has drifted, hollows and depressions are avoided and the attack pushed on those ridges which are relatively free from snow.

942. Because of slowness of movement, reserves are located initially close to the probable scene of future employment. When the ground is covered by snow, the reserve should contain a large proportion of ski troops, infantry-supporting weapons on sleds, and full-track or half-track type motor transport.

943. In a *pursuit* in snow, ski troops, infantry transported in track-laying type vehicles, and artillery equipped with full-track or half-track type prime movers, if available, are assigned to the encircling force. Airborne troops are landed near defiles with the mission of blocking the retreat of the enemy by demolitions and other obstacles.

944. In a *defensive* conducted in snow, every effort is made to delay the progress of hostile preparations and dispositions. By this means the defender endeavors to gain such time as is required under the conditions of terrain, snow, and weather, to readjust his dispositions for meeting the attack.

Combat aviation and the fire of long-range artillery, are employed against hostile columns and transport, and troops in assembly positions. The most mobile troops and weapons are used to delay the hostile advance and development, remaining on this duty until forced to retire within the position. Ski troops are well suited for this purpose. They are equipped with a large proportion of automatic weapons, and are supported by infantry heavy weapons and pack artillery transported on sleds or special vehicles.

945. Deep snow may favor the defense due to the difficulty of movement by the attacking forces and the fact that an immobile force in deep snow can be hidden. Excellent fields of fire are provided over frozen wide streams and lakes which afford little or no cover to the attacker. Keeping the ice broken up for a distance of 20 to 30 feet from the shore will form a difficult obstacle.

946. Open areas which are relatively free of snow, and heavy wooded areas favor the attacker, and are defended in strength and depth. Troops are more lightly disposed when an area has a foreground covered by deep snowdrifts. Antitank weapons are disposed in depth to cover those approaches which have the least snow.

947. Ordinary entrenching tools are ineffective and the organization of a position requires special tools and explosives. The location of a defensive position on the military crest will usually be effective, as both enemy personnel and tanks have difficulty in ascending a steep slope covered with snow. When the ground cannot be excavated, or when necessary to obtain sufficient command for firing, snow trenches are used. At least 5 feet of solidly packed snow is needed for protection from small-arms fire. When a prepared position is garrisoned, it will require heated shelters.

948. The most mobile troops of the defender are held in *reserve*. Because of difficulties of movement, reserves are held close to the probable scene of employment. As in any defense, the integrity of the position is maintained by counterattacks launched against the flank of any force which has succeeded in gaining a foothold within the position. In deep snow, the enemy may be unable to change his dispositions in sufficient time to meet a counterattack directed at his flank, especially when ski troops or troops equipped with snowshoes are employed in the counterattack.

949. The defender utilizes every opportunity to improve routes of communication within the position. Paths are opened in snow between elements occupying forward defense areas, between rear and forward defense areas, and in the most probable directions of employment of reserves. Automatic weapons of reserve units, when not otherwise required, are sited to cover these thoroughfares in order to prevent unexpected use by the enemy.

950. The bulk of the forces employed in delaying action are ski troops, and foot troops transported in vehicles which can operate on snow-covered roads. Troops engaged in delaying action in snow are reinforced by artillery and infantry heavy weapons adapted for movement over snow. Engineers are employed effectively in creating demolitions and other obstacles to the enemy's advance. When the depth of snow is not excessive, every effort is made to impede the movement of hostile mechanized and motorized units which will endeavor to strike at the flanks and in rear of the delaying force.

Section VIII. COMBAT AT DEFILES

951. Any terrain feature which restricts the front of advance of a force is a defile for that force. Mountain passes are a common form of defile. Defiles frequently occur in woods, towns, river crossings, lake regions, and swampy areas. Because of their nature, defiles are comparatively easy to defend and difficult to attack.

952. A defense in front of a defile is employed by advance forces to permit the main body to debouch from the defile unmolested and to secure sufficient space for its deployment. Offensive action may be required to secure sufficient space. The minimum distance from the exit at which the defense is conducted depends on the range of the hostile artillery and the size of the main body. The defense may be conducted in a single position with flanks refused and protected by the obstacles creating the defile or the defender may adopt delaying action to gain the necessary time and space for the debouchment of the main body. Delaying action is particularly effective when opposed by an enemy of lesser mobility.

A defense in front of a defile is often required of a rear guard to cover the retirement of the main body through a defile.

953. A defile may be defended sometimes at points within. The terrain within the defile restricts the front and the maneuver of both defender and attacker. Such a defense can be employed advantageously by small forces only when the flanks are secure, or when the defender's mission is solely one of obtaining limited delays.

Maximum use is made of demolitions, obstacles, and chemicals within the defile to delay the hostile advance. Maximum use is made of available combat aviation due to the enemy's vulnerability to air attack while in the defile.

A position is occupied across the valley with flanks resting on the high ground. Reserves are held close to the position. Counterattacks are launched from the high ground against the attacker's flanks and rear. A defense within the defile is often used in conjunction with a defense in rear of the defile to give depth to a determined defense.

954. Defense in rear of a defile provides maneuver area to the defender while it closes the exit and restricts the movement of the attacker. The defensive position is concave towards the exit with flanks resting on obstacles. The distance of the position from the exit is such that converging fire of all arms can be brought upon the attacker before and during his debouchment. Reserves are held out to give flexibility to the defense and to counterattack promptly against enemy forces which succeed in emerging from the defile. The maximum delay and disorganization of the enemy is effected within the defile by the use of covering forces, artillery concentrations, demolitions, obstructions, chemicals, and air attack.

955. The manner of forcing a defile depends largely upon the manner in which it is held and the accessibility of the flanks. When a defile is held at or within the entrance and the flanks are accessible, the main attack is made in a direction that insures the capture of localities which command the entrance. When the flanks are inaccessible, the attack is made by penetration. When the defile is held at the exit, the attacker attempts to outflank the defense. By moving small forces through or around the obstacles creating the defile, the advance is made on a broad front to outflank defended areas. The attacker debouches from the defile on the widest possible front.

Section IX. JUNGLE OPERATIONS

956. Basic principles of combat are applicable in jungle fighting but difficulties of terrain, visibility, and climate so complicate command, supply, and maneuver as to require variations in technique and application of equipment. However, resourceful leadership, proper training, and suitable equipment will convert natural difficulties into relative advantages.

Control and maneuver over jungle terrain are extremely difficult. Few roads or trails are available;

they often must be slashed as movement progresses. Observation is limited to short distances, sometimes to only a few feet. All these difficulties increase in proportion to the size of the force involved.

957. Supply problems frequently control the entire plan of operation. Lines of communication are tenuous, difficult to maintain, and always vulnerable to attack. In particularly difficult country all material must be moved by hand. Weight-saving expedients are imperative, as are specially trained and equipped medical, engineer, and service troops.

The maintenance and protection of supply routes are major considerations. When available, water routes will be found best, although air transport may also be utilized to relieve troops of the necessity of guarding long and exposed lines. Self-containment of supply, in keeping with the proposed operation, is the ideal.

958. Jungle tactics must be based on sound fundamentals. Control should be facilitated, yet formations must be sufficiently flexible under conditions of limited visibility and vulnerability to fire to permit rapid deployment. In general, units will move in column of files, adequately secured and alert for last-minute deployment into line. Intervals between men should extend to the limit of visibility between them.

Maneuver in the jungle consists of outflanking resistance, using rearward units which break out of the main column to turn the enemy position. Such tactics require basic training to produce resourceful individuals who consider the jungle an ally. Movement through the wilderness must be routine, not an exceptional emergency. Trail-bound troops are a liability in the jungle, not an asset.

959. Jungle areas favor surprise and ambush by small forces. On the march, ambush is a constant threat.

Fortunately, however, the very factors which facilitate trapping a column localize the surprise obtained. Security may be obtained by the use of advance detachments which take position at key points such as stream crossings and high ground. Prearranged and rehearsed plans to meet surprise attacks rapidly likewise insure protection. In jungle movements, distances between elements of a force should be much less than in open country, special measures being taken to maintain contact. Flanks are protected by detachments.

Bivouac areas must be prepared for all-around defense, with suitable fields of fire. Outpost elements are stationed on all roads, trails, and stream beds leading to or near the bivouac area. Frequently the length of the column will dictate bivouac along the trail in depth. In such instances security must be decentralized to the smaller units.

960. Defense in a jungle meeting engagement is difficult. It consists basically in blocking the routes of approach to the attacker's objective. Since these routes are almost always defiles, trails, streams, and ridge lines, strong blocking positions should be established where the attacker's maneuvering power is limited. These positions must be protected against an offensive turning movement, which means that the usual lack of visibility handicaps the defense if the attacker acts aggressively.

Where infiltration past the blocking position must be controlled, use is made of a series of strong support positions organized along a rearward line (ridge line, river line). Reserves must act aggressively and have equal mobility with the attacker. In general, mobility must be used to strike the enveloping force when it is at the greatest disadvantage.

If no objective other than the route itself is threatened, defense can be organized in depth along the route, since the attacker must eventually return to it. Such defenses should constitute a succession of self-contained strong points, organized for all-around defense, with prepared plans for counterattacks at points where the attacker is at a maximum disadvantage.

In terrain where flanks can be anchored to serious obstacles and there is time to lay out and construct intrenchments and gun positions, the characteristics of jungle country give the defense great advantages. Such a position can only be overcome slowly and at great cost to the attacker. If backed by strong, mobile reserves and secure supply lines, such a position, held with determination, can stop superior forces for a long time.

961. The ability to maneuver off trails requires hardened troops, thoroughly acclimated and equipped for close fighting. Their training must enable them to move across country, at least for tactical movements, and give them confidence in their jungle technique. Arms and equipment must be designed for maximum mobility through tangled wilderness under oppressive climatic conditions.

962. The rifle and bayonet, automatic rifle, grenade, submachine gun, carbine, machete, and mortars are weapons suited for jungle fighting. Heavy mortars and rockets may replace artillery in the jungle, when lack of observation and the weight of field pieces limit their employment. Against well-constructed defensive positions flame throwers are extremely valuable. All infantry heavy weapons must be transported by pack, small cart, or on the backs of men. Tanks may be used in close support of infantry.

963. While light mobile forces are an essential in jungle warfare, such troops are too lightly armed to attack strongly organized positions. Part of the force, normally armed, must be moved up rapidly to relieve the advanced troops once such a position is uncovered.

This necessitates rapid preparation of adequate trails and supply lines.

964. Conditions encountered in jungle warfare impede the progress of land forces and greatly restrict the movement of artillery and heavy equipment. Under these conditions it is desirable to use a greater proportion of aviation which has relative freedom of movement over the jungle. Jungle conditions may require the movement of the bulk of the troops, supplies and equipment by air. In jungle warfare the seizure, construction and protection of the necessary airdromes is often made the intial objective of all forces involved.

965. Signal communication is extremely difficult. Visual signalling is often impossible, the use of runners slow and frequently hazardous, the range of radio may be reduced greatly, and wire circuits hard to install and maintain. When clearings are available, drop and pick-up messages are highly satisfactory, provided the liaison type of plane is used. Pigeons are valuable for important messages. In actual combat, wire communication within battalions or similar units is vital.

966. Ground reconnaissance is habitually conducted by small parties. Distances at which security and reconnaissance detachments operate are decreased in proportion to the thickness of the jungle.

967. In general, jungle fighting is conducted at extremely close quarters by relatively small bodies of troops. Initiative by individuals and small unit leaders is the key to success, if exploited by proper discipline, training, and hardening to jungle conditions. The force which is able to move freely off the trails and to maintain itself under extremely arduous conditions will enjoy great advantages.

Section X. DESERT OPERATIONS

968. The character of deserts varies greatly. The surface may consist of loose sand and sand dunes, over which the marching of men and animals is difficult and the movement of motor vehicles is greatly impeded, or may have a hard surface which permits the movement of mechanical transport.

There are seldom any well-defined roads but trails generally exist between water sources. Hard desert is often passable anywhere by motor transport at considerable speed. Half-track vehicles are especially efficient. Stretches of loose, or heavy sand may be made passable by the use of wire netting, canvas strips, or similar means. Low pressure, smooth tread tires assist wheeled vehicles in crossing areas of loose or heavy sand.

There are few landmarks and maintenance of direction is often difficult. Mirage is a constant source of error. Distances are deceptive and usually are greatly underestimated.

969. Desert warfare is characterized by the dependence of movement and operations on supply, particularly supply of water. Lack of roads, difficulties of maintaining direction, the danger of sand storms and the vulnerability of supply columns to air and ground attack impose serious obstacles to the problem of supply. When local water supplies are inadequate, water must be brought from the rear by tank truck, rail, or pipe line.

970. The general doctrines governing offensive and defensive operations apply in desert operations. The troops employed must be acclimated thoroughly before engaging in desert operations. A high degree of mobility is desirable in the forces employed. When the character of the desert permits, the speed, fire power, and comparative independence of water supply of motorized and mechanized forces make them especially useful. The number of animals in the force is held to the minimum, because of the large amount of water they require. Motorized units, mechanized units, or troops transported by air are employed to hold points of tactical importance such as water sources.

971. Air operations are very effective in desert operations since concealment from air observation is difficult. Air transport is especially useful for the supply of isolated detachments.

972. Desert terrain is often very advantageous for a wide encircling or turning movement by highly mobile mechanized forces, in cooperation with combat aviation. Such action may prove decisive.

Section XI. PARTISAN WARFARE

GENERAL

973. *Partisan warfare* is carried on by small independent or semi-independent forces, operating against a greatly superior enemy. The partisan operations are conducted for the purpose of harassing or delaying larger forces, causing losses through attrition, destroying signal communication, or making incursions on the enemy's lines of communication and supply.

Partisan operations may result as an aftermath of the defeat of the main forces of modern armed opponents. They may result from the intention to occupy territory or quell rebellions of semicivilized peoples. The military geography of the area may require operations in mountains, deserts, jungles, or undeveloped terrain. Special arms, equipment, and methods of operations may be necessary. The situation in each instance must be studied critically to determine the appropriate preparations and methods necessary for the conduct of successful operations.

974. In planning partisan operations against a superior force, good information of the enemy's dispositions and movements and a thorough knowledge of the terrain and road net are needed. Large scale operations are avoided. Tactics are based on a small force striking a quick blow with surprise against isolated detachments and unprotected columns or convoys. Raiding parties operating against the enemy's rear carry supplies and equipment essential for as much as several weeks.

The plan of the commander provides for assembling the bulk of the command after each enterprise to prevent its dispersion and to insure proper direction in the conduct of subsequent operations.

975. In the conduct of partisan warfare the mobility, enterprise, and reliability of the troops employed are more important than their numerical strength. In general, the best results are obtained by the employment of numerous small detachments under capable and versatile subordinate leaders, all operating under the direction of an experienced superior commander. The enemy's main body is harassed and held in suspense by repeated threats and raids. Whenever practicable, movements and attacks are made at night. During daylight hours, the main forces remain concealed, leaving only reconnaissance patrols in contact with the enemy.

Use is made of obstacles to delay the enemy in front while attacking him in flank and rear. Raiding parties operating in the enemy's rear may seriously interrupt the enemy's system of supply by destroying bridges and attacking supply trains. Every effort is made to keep in communication with these raiding parties so that their subsequent activities may be properly directed.

Passive measures, operations at night, and dispersion counteract hostile air and mechanized operations.

976. Larger forces engaged in the suppression of partisan warfare have superior organization, armament, and equipment but may be handicapped by lack of reliable information, by dependence on an organized system of supply, and by difficulty in bringing the enemy to a decisive engagement.

977. When the objective of the operations is the destruction of partisan forces or the quelling of tribal uprisings, vigorous and bold action by mobile forces is ordinarily the quickest and surest way of defeating the enemy bands. Usually, this can be accomplished best by an advance on a broad front along all available routes within the affected area against the enemy's principal villages and strongholds. These are then organized as defensive areas from which highly mobile columns conduct operations against any organized resistance located. Since the attacker is usually greatly superior in strength and means of combat, encirclement by double envelopment should be attempted in order to bring about a decisive result.

978. When the objective of the operations is the occupation of the hostile territory, concerted action directed against the capital, the government, the main lines of communication, and main sources of supply is the quickest method of bringing about decisive battles and overthrowing the enemy.

Undue dispersion of force by using numerous minor detached forces may lead to defeat in detail.

Vigorous air attacks conducted in front and on the flanks of operations directed toward vital objectives prevent hostile concentrations that would slow up or divert the main forces. In addition to their material effects, air attacks weaken morale and the will to resist of both the armed forces and the civilian population.

Section XII. AMPHIBIOUS OPERATIONS

979. *Amphibious operations* involve joint land, naval, and air action for the landing of sufficient troops on a hostile shore to establish a beachhead on which to land the necessary force to carry on the normal type of war. Such operations present many technical and tactical problems requiring special organization and equipment and landing craft of proper types.

980. Prior to operational planning it is essential to make long-range meteorological forecasts and detailed studies of the enemy defense system and of beach and hydrographic conditions in the area selected for the landing.

Planning is centralized and is based on the tactical scheme of maneuver of the landing forces. Due to the need for secrecy, detailed plans, except essential elements, are withheld from lower echelons until just prior to the operation.

981. The highly complex nature of amphibious operations makes centralized control impractical during the initial stages of a landing and requires a great degree of cooperation between the participating services. This makes intensive training mandatory. Subordinate units must be trained to operate independently until the next higher echelon arrives on shore and assumes control. On completion of initial training, joint full-scale rehearsals of the contemplated operation are conducted.

982. The most critical period of the landing is during the approach to the beach, as hostile small arms and artillery fire break up boat formations and causes numerous casualties. During the landing phase it is essential that provisions be made for naval gunfire and air support to dominate effectively the fire from beach defenses and insure the safe landing of the force.

Smoke, effectively employed, decreases the percentage of casualties. Landing beaches constitute a serious bottleneck and it is necessary to provide for the rapid and orderly movement of troops and supplies inland through the critical beach area.

983. Sufficient air strength must be available to insure air superiority within the area of amphibious operation and to provide the necessary air support. Preliminary bombing of the land communications serving the area of landing operations may be required.

It is desirable that airborne troops and transport aircraft be available on a scale sufficient to undertake a major role in the neutralization of enemy coast defenses in the landing area, capture airfields, and delay the movement of enemy reinforcements to the landing area. Naval forces are necessary to provide protection for the amphibious expedition. Effective antiaircraft support during the landing and subsequent beach organization will be needed in order to reduce the effectiveness of hostile air activity in that critical area. Tanks are valuable in clearing beach defenses and breaking up the movement of hostile local reserves.

984. Efficient communication is of great importance if necessary control of ships, landing craft, aircraft, and troops in this complicated operation is to be achieved. Consequently signal communication agencies must be carefully organized and equipped and given a very high degree of combined training.

Engineers normally are employed to reduce obstacles to the landing, organize the beaches and form a mobile beach reserve.

Evacuation in the initial stages is performed by empty landing craft returning for more supplies. Battalion and regimental aid stations, collecting stations, and clearing stations are set up as soon as the situation permits.

985. In amphibious operations, supply difficulties are increased greatly as the maximum cargo carrying capacity of ships usually is sacrificed to permit tactical loading. While troops must land properly equipped and ready to fight, all equipment must be kept to the minimum and non-essential items omitted. Provision must be made for sufficient initial supply to safeguard against possible delay in resupply. Levels to be maintained are prescribed by higher headquarters.

986. The success of continued tactical operations ashore depends on the ability of supply agencies to furnish all classes of supply to combat units. In order to do this, it is necessary at an early stage of the operations to capture a port that can be opened quickly and put in working order. This must be followed by capture of additional ports as soon as possible. However, plans must be made for maintenance over beaches for a long period.

CHAPTER 14

AIRBORNE TROOPS

GENERAL

987. *Airborne forces* are ground forces which are specially organized, trained, and equipped to utilize air transportation for entry into combat. Normally such units will include parachute- and glider-borne elements. They should not be confused with other ground units, many of which may be transported by air, but which are not specifically organized, trained, nor equipped for this method of movement.

988. *Troop carrier forces* are air forces which are specially organized, trained, and equipped to transport airborne troops and supplies into combat. They should not be confused with elements of the Air Transport Command.

989. An *airborne task force* is a force composed of airborne and troop-carrier units for the accomplishment of a specific mission. It may include other ground units which are transported by aircraft, and which disembark after the aircraft reaches the ground.

990. Airborne units are organized into airborne divisions, airborne brigades, or separate parachute and glider units. These units are smaller in size than comparable ground units. They include infantry, artillery, engineers, and essential services.

991. Equipment of airborne forces is limited to that which can be transported in available aircraft.

992. Airborne and troop-carrier units are theater of operations forces. Plans for their employment are initiated by the agency which coordinates action of all land, sea, and air forces. *This responsibility should not be delegated to lower headquarters, otherwise positive coordination cannot be insured.*

Airborne units should remain under the direct control of the theater commander until they land in the ground combat area, when control passes to the officer in command of that area.

993. *Air superiority* is a fundamental prerequisite for successful airborne operations. The degree of air superiority which can be attained will be a major factor in determining whether airborne operations should be conducted during daylight or under cover of darkness.

994. To secure maximum effectiveness, airborne troops should be employed—

a. By surprise.

b. In mass.

c. As part of a combined effort in close coordination with other military or naval forces.

d. In a manner that will contribute to the success of the main effort.

e. Only on missions that cannot be performed as economically or as expeditiously by other ground forces.

995. As airborne units are not organized or equipped for sustained action they should be employed only when they can be supported or relieved within a period of 3 to 5 days. Timely relief facilitates reorganization and reequipping and insures early availability for further missions.

996. *Airborne units* may be used to—

a. Seize, hold, or otherwise exploit important tactical localities in conjunction with or pending the arrival of other forces.

b. Attack the enemy rear and assist a break-through or landing by the main force.

c. Block or delay enemy reserves by capturing and holding critical terrain features.

d. Capture enemy airfields.

e. Capture or destroy vital enemy installations, thereby disrupting his system of command, communication, and supply.

f. Create diversions.

g. Delay a retreating enemy until the main forces can overtake and destroy him.

h. Reinforce threatened or surrounded units.

i. Seize islands or areas not accessible to other ground forces.

997. The primary missions of troop carrier units are to—

a. Provide air transportation for airborne forces into combat.

b. Supply such forces until they are withdrawn or can be supplied by other means.

c. Provide air evacuation of casualties.

998. The secondary missions of troop carrier units are to—

a. Provide emergency supply and evacuation.

b. Ferry troops and supplies.

c. Provide routine transportation of personnel, supplies, and mail.

999. Within limitations imposed by his mission and orders, the airborne commander will select the general area for the landing of airborne troops. Specific fields for the landing of gliders and powered aircraft will be selected by the troop carrier commander within the areas acceptable to the airborne commander.

1000. Routes, altitudes, time schedules, and means of identification while in the air and on the ground must be known by all forces concerned, air, ground, and naval, in order to provide mutual security and to preclude firing on friendly forces. Dissemination of this information is the responsibility of higher headquarters. Establishment of a common challenge, password, and reply for all troops by the highest command is essential. The altitude and route must be selected carefully and coordinated with all participating forces. The route should avoid naval convoys and antiaircraft installations whenever possible. If routes lie close to naval convoys, mutually exclusive lanes for aircraft and naval vessels should be prescribed by the higher commander. An air lane with a minimum width of 5 miles on each side of the line of flight is necessary.

TIMING OPERATIONS

1001. Airborne units may operate either by day or night. During daylight, navigation is easier, troops can be more rapidly concentrated at the landing area than at night and, after landing, troops can be assembled quickly and control regained. The chances of surprise are increased in night operations and formations are less vulnerable to enemy air and antiaircraft attack. Glider operations are practicable only when there is a quarter moon or better.

Daylight landings in conjunction with use of smoke combine some of the advantages of both a day and night operation. In addition, a night take-off followed by a daylight or dawn landing, facilitates surprise.

COOPERATING AVIATION

1002. Cooperating aviation is all combat aviation which assists in the preparation and execution of an airborne mission. Cooperating aviation is coordinated with the mission of troop carrier and airborne units by higher headquarters.

PLANNING AND TRAINING

1003. The airborne operations must be an integral part of the basic plan. To superimpose the airborne phase of an operation already planned will rarely if ever be successful.

Plans must provide for the necessary preparation by troop carrier, airborne, and cooperating aviation units, to include joint training and practice operations and the concentration of these units in the departure areas. Realistic joint training is vital. Such training must cover all details of the operation and should culminate in a full rehearsal of the operation on terrain and under conditions closely approximating combat.

Upon issuance of orders by higher headquarters the commanders of the airborne, troop carrier, and cooperating aviation forces jointly formulate a plan. This plan, when approved, should be considered fixed; changes should be required by higher headquarters only if sufficient time is available for complete coordination.

Weather must be carefully considered. In the event of unfavorable weather, higher headquarters must be prepared either to postpone launching the main operation or to operate without airborne forces.

All plans must be simple and flexible.

CONDUCT OF OPERATIONS

1004. Airborne operations are characterized by the speed and surprise with which such troops can execute an attack in hostile rear areas or can intervene at critical points.

For daylight operations, *preliminary air attacks* against the prospective landing areas to destroy or disorganize local defenses may be made. Usually, night operations are carried out without preliminary air attack.

The landing of parachute and glider troops during daylight should be timed to follow closely the preliminary air attacks.

During night air movement and landings, great care must be taken to insure that military and naval bombardment does not so light up the ground by explosions and fires, with resultant dust and smoke, that recognition of routes and landing areas becomes impossible.

SUPPLY

1005. The headquarters directing the employment of airborne units must provide for their supply.

Supply may be by ground or air means. Supply by glider or powered aircraft is more economical than supply by parachute.

In the case of air supply the airborne commander must submit his requirements during the planning phase of the operation to higher headquarters which, through its service agencies, will assemble the necessary supplies at a designated airbase or bases. Packaging, loading, and delivery of these supplies to the combat area is a function of the Army Air Forces. (See FM 31–40.)

MEDICAL CARE AND EVACUATION

1006. The general doctrines of medical service, described in detail in FM 8–10 apply with slight modifications to airborne operations.

1007. An airborne division is organized and equipped to provide treatment and transportation to the point selected for evacuation by air. Higher echelons of evacuation may be by airborne or ground medical organizations, depending on the situation and availability of means. Patients may be evacuated to a rear base by returning transport aircraft or by specially organized, trained, and equipped air evacuation squadrons.

1008. Mobile hospital units capable of treating serious casualties may be air transported to the combat area to receive casualties.

1009. For details of operations see FM 31–30, 31–40 and 101–10. For countermeasures against airborne troops see paragraph 275.

CHAPTER 15

THE DIVISION

Section I. INFANTRY DIVISION

1010. The infantry division is the *basis of organization of the field forces.* It is the smallest unit that is composed of all the essential ground arms and services and which can conduct, by its own means, operations of general importance. It can strike or penetrate effectively, maneuver readily, and absorb reinforcing units easily. It can act alone or as part of a higher unit.

The combat value of the infantry division derives from its ability to combine the action of the various arms and services to maintain combat over a considerable period of time.

1011. Three regiments of Infantry and four battalions of Field Artillery comprise the major combat elements. All organic transportation is motorized, although it does not have sufficient transportation to move all its elements simultaneously.

1012. The doctrines of operations and combat by ground, nonmechanized forces discussed in earlier chapters are applicable to the infantry division.

1013. When a division is operating as part of a higher unit, restrictions on the freedom of action of the division commander are often necessarily imposed by the higher commander. In an advance, the corps commander will ordinarily prescribe a zone of advance for each division of the corps. The road net within the zone may largely influence the march formations and supply arrangements within the division. The corps may also prescribe the general line which advance guards of the divisions will cross at a given time at the beginning of the march, the extent of the march, as well as any special formation of the corps for the advance.

Further coordination may be obtained by designating lines which the various divisions must clear by specified times and by designating rear boundaries for divisions at the completion of each stage of the march.

1014. *When fully motorized by the attachment of additional transport,* the infantry division is a highly mobile unit. It is then especially suited to execute the following types of operations:

a. To provide close support of armored units; to consolidate and hold gains made by such units.

b. To seize and hold important localities pending arrival of less mobile forces.

c. To exploit success achieved by armored, airborne, and other units.

d. To execute envelopments and turning movements either in close cooperation with armored and other mobile units or, under favorable conditions, independently against hostile flanks and rear or strategic localities.

e. To constitute a powerful mobile general reserve for use either offensively or defensively as the situation demands.

1015. The army or corps has reconnaissance elements which operate in advance of the divisions. While cooperation and contact between these reconnaissance elements and those of the division are necessary, their presence in no way relieves the division commander of responsibility for reconnaissance by and security for his own command.

1016. In combat, the mission assigned the division may require the division to act in close coordination and cooperation with adjacent divisions or to operate at a distance from the main force. The decisions and actions of the division commander in either situation are predicated upon the greatest assistance to the successful execution of the task of the higher commander.

1017. In all operations, the personal reconnaissance of the division commander is of the highest importance. He makes use of all available means of transportation to reach vantage points from which he can gain direct information and exert his influence most effectively and expeditiously on the operations. He must be provided with alternate means of signal communication so that his orders can be speedily transmitted.

Section II. LIGHT DIVISION

1018. The *light division* is organized so as to be suitable for amphibious, airborne, mountain, or jungle operations. Its major combat elements consist of three infantry regiments (somewhat smaller than those found in the infantry division) and its division artillery (basically three battalions of 75-mm howitzers). There is a minimum of organic transportation.

1019. Equipment will vary with the type of operation.

1020. The division operates on foot, with handcarts, except for essential loads that cannot be transported in this manner. Such loads will be handled by pack animals or $\frac{1}{4}$-ton trucks. If conditions permit, the division may be reinforced by larger trucks.

1021. The division can function efficiently under adverse terrain conditions. The doctrines of operation and combat for infantry divisions (sec. I) are applicable to the light division.

Section III. CAVALRY DIVISION

1022. The *cavalry division* is a tactical and administrative unit consisting of a division headquarters and headquarters troop, two cavalry brigades. a mechanized reconnaissance squadron, artillery, engineer, signal communication and service elements. Mechanized reconnaissance units primarily for distant ground reconnaissance, motor trucks for supply, and motorized elements for command and signal communication purposes are all organically contained in the division to transport a limited number of horses, men, and equipment. Its organization is such, however, that it can continue to operate effectively without the motor elements.

The cavalry division may be assigned independent missions which require operations far from other troops. It may be assigned, attached to a corps or larger force. or held in reserve.

1023. The *primary mission* of the cavalry division is combat. The mobility of the cavalry division permits it to extend the scope of operation of less mobile ground troops. In a war of movement, the cavalry division is employed initially for surprise thrusts into enemy territory, for reconnaissance, and for screening and covering other forces. Thereafter, its most effective employment is in large groups for swift and decisive action. Its main strength must not be dissipated through indiscriminate detachments, nor sacrificed through prolonged performance of missions which can be performed more satisfactorily by other arms.

1024. Cavalry ordinarily executes reconnaissance in cooperation with aviation. Aviation locates the enemy at a distance and orients the ground reconnaissance elements, thereby conserving their energy and speeding up their execution of reconnaissance.

1025. The cavalry division executes reconnaissance for larger units in accordance with instructions from the higher commander who assigns to the cavalry division a zone of reconnaissance which ordinarily does not exceed 25 to 30 miles in width. The cavalry division commander redistributes this zone to reconnaissance detachments varying in strength and composition according to the enemy opposition expected and the relative importance of their missions.

In distributing forces for reconnaissance and in assigning missions, the division commander estimates the relative importance of factors affecting the mission of the division and assigns greater strength and a more aggressive mission to detachments operating in decisive zones.

The cavalry division commander indicates the general axes or zones for reconnaissance detachments within the division zone of action and the lines to be reached at designated times by elements of the detachment. The distance between the reconnaissance detachments and the main body of the division varies with the situation; at times, it may become several days' march. Reconnaissance detachments are not responsible for the immediate security of the division. This must be provided by the detail of the necessary covering forces.

When the distance between the main opposing forces is so reduced that the mobility of the cavalry cannot be utilized, the division should be rapidly shifted and, depending upon the situation, directed against the enemy flanks or rear, disposed to protect a flank, or placed in reserve.

1026. A cavalry division protects the disposition and action of other ground forces by counterreconnaissance or screening, which may be conducted either offensively or defensively. In executing a counterreconnaissance mission. the division seeks to defeat or neutralize enemy ground reconnaissance forces.

The dispositions of the division in offensive counterreconnaissance are similar to those prescribed for reconnaissance. Reconnaissance detachments operate aggressively and locate the main enemy forces to obtain information for the division upon which it can base further operations. In defensive counterreconnaissance, which is most effective when established along a continuous obstacle, patrols are pushed to the front; and the division commander disposes his forces so as to block the main routes of approach.

When screening the concentration of large forces, cavalry divisions usually act defensively. The screen utilizes available obstacles to the maximum and is established at a sufficient distance to the front to keep enemy ground reconnaissance agencies from observing the location and disposition of the forces being concentrated.

1027. Large bodies of horse cavalry normally maneuver mounted and fight dismounted. Cavalry uses the mobility of its horses to gain the advantage of surprise against the hostile flanks and rear from which dismounted fire attacks can be employed effectively and decisively.

Long mounted advances against troops in position, and mounted attacks against prepared positions or against troops in position and able to employ their combat power effectively, should not be made.

1028. The dispositions of the cavalry division for attack usually include a pivot of maneuver about which the command operates, a maneuvering force charged with the main attack, and a reserve.

As soon as contact with the enemy is foreseen, the division endeavors to secure points of observation and to deny them to the enemy.

In a meeting engagement, the advance guard establishes the pivot of maneuver. In a more deliberately prepared attack, a special force may be detailed to establish it. The pivot of maneuver engages the enemy's attention and pins him to his position by a fire attack or by a combination of fire attack and maneuver.

1029. The maneuvering force contains the main offensive power and often constitutes the greater part of the division. The division commander assigns to the leader of this fraction the accomplishment of the vital offensive action and allows him sufficient liberty of action to take full advantage of the developments of the situation. He informs him of the general plan, the mission of the maneuvering mass, and the duties of the other elements of the division. He usually specifies the general location, and the route thereto, from which the attack of the maneuvering force is to be launched.

1030. The reserve is held mobile. It is located initially in an area favorable to the plan of employment. The division commander commits the reserve promptly to strike enemy weakness, to exploit a success, to pursue a defeated enemy, to cover a reorganization, to assist in holding a position gained, or to cover a withdrawal.

1031. *When a cavalry division is employed to exploit a break-through,* it is moved to the vicinity of the expected break in the enemy's defenses. The breach should be sufficiently wide to enable the cavalry to pass through without receiving severe fire from the flanks. The division should be assigned a specific aggressive mission.

1032. *When the cavalry division executes an encirclement,* it may perform one or more of the following missions:

a. Destruction of enemy installations.

b. Execution of demolitions on his line of withdrawal.

c. Occupation of favorable positions to block enemy retreat.

d. Attacks against enemy flanks.

1033. *When the cavalry division acts alone in pursuit,* it destroys the retreating enemy by direct pressure and encircling movement. (See ch. 10.)

1034. The cavalry division may be employed on the defensive to seize and hold a position pending the arrival of other forces, to cover a withdrawal, to delay enemy advance, to fill a gap in a defensive position, or to counterattack.

1035. *When acting alone in defense*, the cavalry division organizes a position with part of the force and engages the enemy at a distance with the remainder. The mobility of cavalry is employed to best advantage in defense by engaging the enemy in advance of the final position and conducting a delaying action. The reserve should be large when the division is opposed by an enemy with strong mobile elements. Within their capabilities and limitations, elements of the division organize a defensive position in the same manner as infantry.

1036. The cavalry division employs frontal delay and flank attack in delaying action. Offensive or defensive tactics, or a combination of the two are used. The division acts aggressively but avoids decisive combat before suffering serious loss. Delay is accomplished by forcing the enemy to reconnoiter, maneuver, and deploy. Delaying positions are occupied successively and are organized as thoroughly as time permits.

Section IV. ARMORED DIVISION

ORGANIZATION

1037. The *armored division* is the basic large armored unit of the combined arms. It comprises a balanced unit of essential ground arms and services so organized and equipped as to make it tactically and administratively self-contained. It is capable, to a limited extent, of independent action. Detachment of any unit disturbs the balance and should be made only after careful consideration of the probable effect upon contemplated operations of the division.

1038. The armored division is organized for flexibility in the formation of combat teams. The self-contained battalion is the basic combat unit. The division consists of a headquarters, two combat commands, a reserve command, a cavalry mechanized reconnaissance squadron, three tank battalions, three armored infantry battalions, the division artillery consisting of a headquarters and three armored field artillery battalions, an armored engineer battalion, and signal and service troops. Units are attached to the two combat commands and the reserve command in the type and number desired for a particular operation.

CHARACTERISTICS

1039. The armored division is a powerfully armed and armored, highly mobile force. Its outstanding characteristics are its battlefield mobility and protected fire power. Other important characteristics are extended radius of action; shock power; and great sensitiveness to mine fields and other obstacles, unfavorable terrain, darkness, and weather.

1040. The armored division is organized primarily to perform missions that require great mobility and fire power. It is capable of engaging in most types of ground operations, either as part of a larger force or independently when reinforced. Its primary role is offensive operations in hostile rear areas. It may be employed to—

a. Break through an enemy protective screen and establish early contact with hostile forces.

b. Seize ground essential to the development of the higher commander's plan.

c. Regain the initiative by means of surprise attack or restore the impetus of an attack that has lost momentum.

d. Spearhead the attack against an enemy incompletely prepared for defense.

e. Attack on a narrow front against a prepared position.

f. Break through on a wide front against a demoralized enemy.

g. Exploit a success.

h. Pursue a defeated enemy.

i. Perform strategic envelopment.

j. Attack to destroy enemy armored units when forced to do so as a matter of self-preservation or when hostile tanks threaten seriously to disrupt operations of other troops.

k. Operate against lightly armored formations or installations.

l. Counterattack in withdrawal to disrupt hostile operations.

m. Execute delaying action.

1041. *Armored infantry and tanks* supported by artillery operate in close coordination. Seldom will tanks operate without infantry support.

1042. The *tank battalion* is the heavy striking element of the division. Its primary mission is to close with and destroy the enemy. Tanks—

a. Destroy or neutralize automatic weapons, particularly machine guns, and personnel likely to hold up the advance of the infantry.

b. Neutralize the objective until the infantry has arrived and taken over.

c. Destroy or neutralize hostile reserves and artillery in the battle area.

d. Make passages through wire or other obstacles, except antitank obstacles.

e. Break up hostile counterattacks.

f. Attack to destroy enemy reserves forming for counterattack.

g. In defense, counterattack to eject an enemy that has succeeded in penetrating the position.

h. Give close fire support to infantry.

i. Execute reinforcing artillery fires.

1043. The *light tank company* may be used to exploit the success of medium tanks: probe for weak points in the enemy position, execute battle reconnaissance, act as a covering force, draw the enemy into prepared traps, and act as advance, flank, or rear guards.

1044. The *medium tank companies* are usually the leading waves of the attack.

1045. The *armored infantry battalion* is a powerful, mobile, lightly armored unit. It moves forward in vehicles until forced by terrain or enemy fire to dismount. Its primary role is the support of the tanks. In performing this role it may—

a. Follow the tank attack to wipe out remaining enemy resistance.

b. Seize and hold ground gained by the tanks.

c. Attack to seize terrain favorable for a tank attack.

d. Form, in conjunction with artillery and tank destroyer units, a base of fire for the tank attack.

e. Attack in conjunction with tanks.

f. Clear lanes through mine fields in conjunction with engineers.

g. Protect tank units in bivouac, on the march, in assembly areas, and at rallying points.

h. Force a river crossing.

i. Seize a bridgehead.

j. Establish and reduce obstacles.

k. Organize and defend a position.

l. Perform reconnaissance and counterreconnaissance.

1046. The *armored artillery* is highly mobile, self-propelled, and armor-protected. Its primary mission is close support of the advancing elements of the division by individual and massed battery fires.

1047. The primary role of the *armored engineer battalion* is to facilitate the rapid movement of the division. It executes engineer reconnaissance, breaches and lays mine fields, erects or demolishes other obstacles, and to a limited extent makes emergency repairs on roads. When necessary, it participates in combat. When extensive bridging and repairs are necessary, reinforcements by additional engineers and equipment, including engineer treadway bridge companies, must be provided.

1048. The primary mission of the *cavalry mechanized reconnaissance squadron* is, in conjunction with reconnaissance aviation, to furnish the division commander with information upon which to base a plan of action. Its secondary mission is counterreconnaissance. It should not be used for purely security missions. Reconnaissance units seek particularly for weak spots in the enemy positions.

OPERATION

1049. The armored division usually operates in a corps consisting of one or more armored divisions and one or more infantry (cavalry) divisions. It may, either by itself or reinforced, operate directly under army.

1050. In general, the role of the infantry division operating with armored division is to create an opportunity for the armored division to exploit. The infantry division secures ground from which the armored division may launch a decisive attack; creates a gap for the armored division to pass through; or forms a base of maneuver for the armored division.

1051. The armored division should be free to take advantage of its mobility to defeat the enemy decisively. Mobile infantry should follow it closely to protect the flanks and rear, relieve the armored infantry, protect reorganization, and to free the armored division for further action.

1052. Operations of the armored division are characterized by employment in mass, the full utilization of surprise, and by maneuver in a decisive direction. Four conditions should be present or created for decisive offensive action. They are effective reconnaissance, favorable terrain, adequate reserves of supplies, and absence or neutralization of hostile antitank means. Air superiority and surprise are highly desirable.

1053. The objective of the armored division is the complete destruction or dislocation of the enemy. To attain this objective the division may either attack enemy troops directly or attack to seize dominating ground from which operations against hostile rear areas may be initiated. In advancing to its objective a series of intermediate objectives may be seized.

1054. Attack is usually launched from assembly areas but may be launched direct from march column.

1055. In general there will be a base of fire, a maneuvering force, and a reserve. The base of fire consists of the bulk of the artillery protected by infantry and tank destroyers. When the terrain is suitable, the maneuvering force should consist of the bulk of the tanks, with some infantry, artillery, and other supporting units. Attack may be made either by envelopment or through the base of fire.

1056. The initial objective of the attack should be within range of the base of fire.

Tanks lead the attack when terrain is favorable and hostile antitank defenses are weak. Infantry leads the attack over unsuitable tank terrain or against a strong antitank defense. Tanks and infantry may attack together, particularly when strong antitank defenses may be expected.

When tanks encounter unfavorable terrain or strong antitank defenses, the infantry passes through the tank formations, and supported by the fire of tanks, continues the attack. Similarly when favorable terrain and enemy antitank defenses permit, tank units pass through the infantry and continue the attack.

1057. In *defense,* as part of a larger force, the armored division is used to counterattack, to disorganize the enemy's attack preparations, to regain lost ground, or to spearhead a counteroffensive. Seldom will the division be assigned a defensive sector.

When required to occupy a defensive position, the division places its infantry on the position, and uses tanks as local and general reserves.

1058. In *withdrawal,* the armored division is usually employed to make limited objective attacks against enemy forces offering the greatest threat.

The armored division, reinforced by sufficient tank destroyers and antitank guns and well supplied with antitank mines and demolitions, can effectively delay enemy formations. As part of a larger force in delaying action the armored division is used as a reserve for counterattack, for diversionary attacks against the flanks to dislocate the enemy or for flank protection. When acting alone it may delay in one or successive positions. The infantry occupies the position while tanks are used for counterattacking.

1059. In *attack of a river line* the armored division usually crosses after the establishment of a bridgehead. When required to force a river crossing the division should be suitably reinforced with infantry and engineers. The infantry supported by artillery and fire of medium tanks, forces the crossing. Some tanks may be ferried across early. Other tanks are crossed after the bridge has been built.

1060. In *defense of a river line,* the armored division is usually held in reserve ready to move quickly to any threatened point. When required to defend a sector of the river. elements of the reconnaissance squadron patrol the far bank while infantry and reconnaissance units patrol the near bank. The bulk of the division is held as a reserve.

1061. The armored division avoids the attack of towns, if practicable. When an attack on a town is necessary, infantry makes the direct assault with the fire support of tanks and artillery. Tanks are used to encircle the town to prevent reinforcements and escape.

1062. In the attack of fortified positions, other troops usually breach the defenses and the armored division then passes through the gap. (See FM 31-50.)

1063. For a more complete discussion of the armored division see FM 17-100.

CHAPTER 16

TANK DESTROYER AND NONDIVISION ARMORED UNITS

Section I. TANK DESTROYER UNITS

1064. *Tank destroyer units* are organized into brigades. groups, and battalions. Battalions are tactical and administrative units and may be armed with either self-propelled or towed tank destroyer weapons. The group consists of two or more battalions of one or both types. The brigade consists of two or more groups.

1065. Tank destroyer units are highly mobile, are capable of massing a great amount of armor piercing fire power, and are provided liberally with radio for communication. The self-propelled tank destroyer is highly mobile but its light armor makes it vulnerable to antitank gun fire. The towed tank destroyer is more easily concealed but has less armor protection and battlefield mobility than the self-propelled destroyer, and once in position, is difficult to move under fire.

1066. The primary mission of tank destroyer units is the destruction of hostile tanks by direct gun fire.

When not employed on their primary mission, tank destroyers may be employed as reinforcing artillery; to defend beaches; to destroy pill boxes and other permanent fortifications; and to give direct fire support to assaulting troops.

1067. Ammunition requirements for secondary missions may exceed the supply capabilities of tank destroyer units. Under such conditions, higher headquarters must assume responsibility for supplying the additional ammunition. Except in emergency, organic loads should remain intact for primary missions.

1068. Tank destroyer action consists of—

a. Seeking information of hostile tanks by vigorous reconnaissance.

b. Movement to firing positions so as to intercept hostile tanks and arriving in advance of the tanks sufficiently to permit proper emplacement and concealment of tank destroyers. *Tank destroyers ambush hostile tanks but do not charge or pursue them in the open.*

c. Destruction of hostile tanks. When tanks advance, the tank destroyers hold their ground since destruction by fire can be accomplished best at close range.

1069. Tank destroyers are vulnerable to antitank gun, tank, and artillery fire and every practicable means must be taken to secure concealment. In featureless terrain they must be dug in. The most advantageous positions are those affording flanking fire.

1070. As the point of hostile armored attack will rarely be known beforehand, forward units are provided with a minimum of organic antitank guns. These guns delay the hostile attack and cover the employment of tank destroyers. Some tank destroyers, preferably towed guns, may be attached to reinforce organic antitank guns. As the hostile armored attack develops, tank destroyers are placed into action progressively to counter the threat.

1071. The following considerations are paramount in the employment of tank destroyers on their primary mission:

a. Tank destroyers should be massed to cover terrain passable for tanks.

b. When the location and strength of hostile armor is unknown, the bulk of the tank destroyers should be held in readiness, prepared for rapid movement to a threatened area.

c. When the location and strength of hostile armor is known, tank destroyers are massed to counter their movement.

1072. The tank destroyer battalion should be employed as a unit. Employment by separate company or smaller unit seldom gives good results and frequently results in failure.

1073. Massed tank destroyer units may be deployed in firing positions, subject to rapid movement to other positions; or they may be held initially in readiness, prepared to move to firing positions as the situation develops.

1074. An efficient antitank warning service is essential. Information is obtained also by liaison with higher headquarters and other ground and air intelligence agencies.

1075. *On the march* in the presence of hostile armored units, security detachments should be strong in tank destroyers. Depending upon the enemy's proximity and capabilities, massed tank destroyers are distributed along columns, or held in readiness at successive points along the route.

1076. *In bivouacs and assembly areas* when armored attack is an enemy capability, towed tank destroyers should be employed to strengthen the antitank defense of the area. Self-propelled tank destroyers may be massed ready to move to probable points of attack.

Some self-propelled tank destroyers may be attached to the outpost.

1077. *In the attack*, massed tank destroyers are disposed to meet hostile armored counterattack, especially from exposed flanks. When operating with an armored division in the attack, towed tank destroyers may be used to strengthen the antitank defense of the base of fire and to protect the flanks. Self-propelled tank destroyers are usually held in reserve, ready to move quickly to block an enemy counterattack.

1078. *In defense*, time is usually available for thorough preparation and organization of tank destroyer positions and routes of access. The warning system is perfected. Observation and reconnaissance are organized fully. If the hostile armored units can be located beforehand, tank destroyers can be massed accordingly. If hostile tanks break through the forward elements of the defensive position, massed tank destroyers are moved to positions ahead of them or to one or both flanks.

1079. *In pursuit*, when enemy armor is still intact, our encircling forces should be strong in tank destroyers.

1080. *In retrograde movements*, tank destroyers are used boldly and aggressively to delay, drive off, or destroy hostile tanks.

1081. For a more complete discussion of tank destroyer employment, see FM 18–5.

Section II. NONDIVISION ARMORED UNITS

1082. Nondivision armored units consist of armored groups, tank battalions, armored infantry battalions, and armored field artillery battalions. These battalions are the same as those of the armored division. The armored group consists of a headquarters and two or more battalions, all of one type or in any combination. The group is a tactical unit only.

1083. For characteristics and missions of armored battalions see section IV, chapter 15.

1084. Nondivision armored units are attached by group or battalion to corps or division (armored, infantry, or cavalry).

1085. Nondivision armored units operate as do like units of the armored division. Because of their mobility, armored infantry and armored artillery battalions are particularly suited for operation with tank battalions and should be so used when attached to an infantry (cavalry) division.

1086. When terrain is suitable, tank units are allotted to the main effort. When terrain is unsuitable for tank operation, medium tanks may be used as reinforcing artillery or held in reserve unless their operation in some other area will materially assist the main effort. Where terrain is unsuitable for mass tank employment or the situation is not favorable for such employment, companies, platoons, and even individual tanks may be attached to infantry (cavalry) units.

1087. The infantry-tank attack is divided into six phases: reconnaissance, preliminary coordination, preparatory fire support, the infantry-tank assault, consolidation, and continuation of the attack. The infantry-tank team operates as in the armored division (par. 1045).

Upon reaching the objective, tanks overrun the position and cover the objective by fire. The infantry must follow the tanks closely and occupy the objective promptly. When the infantry occupies the objective, the bulk of the tanks withdraw to the rallying points.

Some tanks may be left as a local reserve until the infantry has consolidated the position.

1088. In *defense,* tank units are used as a reserve for counterattack. The counterattack is organized similarly to the attack and is made in conjunction with infantry. The reserve position should permit rapid movement of the tanks to any probable area of employment.

1089. In *daylight withdrawal* from action, tanks may be used to make limited objective attacks to disrupt the enemy attack. Except on bright moonlit nights, tanks will seldom be used in night withdrawal.

1090. In *delaying action,* tanks are usually held in reserve and employed for limited objective attacks. When terrain is unfavorable for mass employment small units of tanks may be attached to infantry.

1091. Tanks may be used to make night attacks in conjunction with infantry. Such attacks are usually made on bright moonlit nights. They require detailed reconnaissance and careful coordination. Special means of maintaining direction should be prescribed.

1092. In the *attack of a fortified position or combat in towns,* tanks may be used to support the attack of the infantry by direct fire. Specially equipped tanks may be used to assist in breaching the defenses. (See FM 31–50.)

1093. In jungle warfare, tanks are usually employed in groups seldom larger than a company. They advance with the infantry and destroy hostile emplacements by fire and shock action.

1094. For a more complete discussion of tanks in support of infantry, see FM 17–36.

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